Digital Product Data Acquisition Course

Your Instructor: Gerald Tritle

Air Force
Product Data Systems Modernization (PDSM)
Program Office

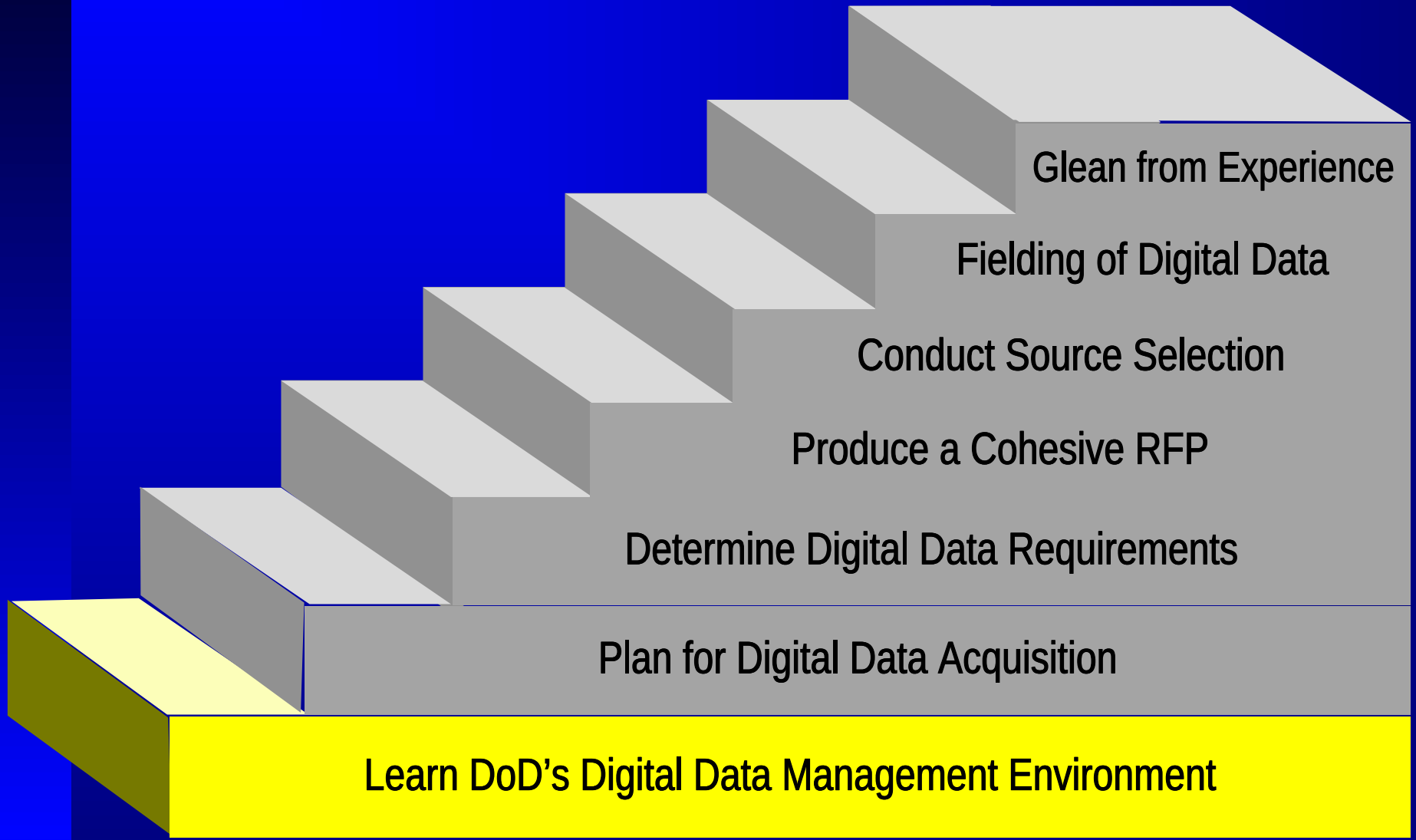
Course Scope

- Learning the digital data particulars of product data acquisition
- Understanding the options available in digital product data acquisition
- Learning the format requirements for buying digital data that will be compatible with JCALS and JEDMICS
- Understanding issues associated with fielding digital data

Your Learning Mission

- To better understand DoD and Air Force digital product data policy and infrastructure
- To determine digital data types, formats, and delivery/access requirements
- To produce effective RFPs for acquiring digital product data in JCALS and JEDMICS compatible formats
- To become acquainted with CALS implementation pointers

Digital Data Acquisition Steps



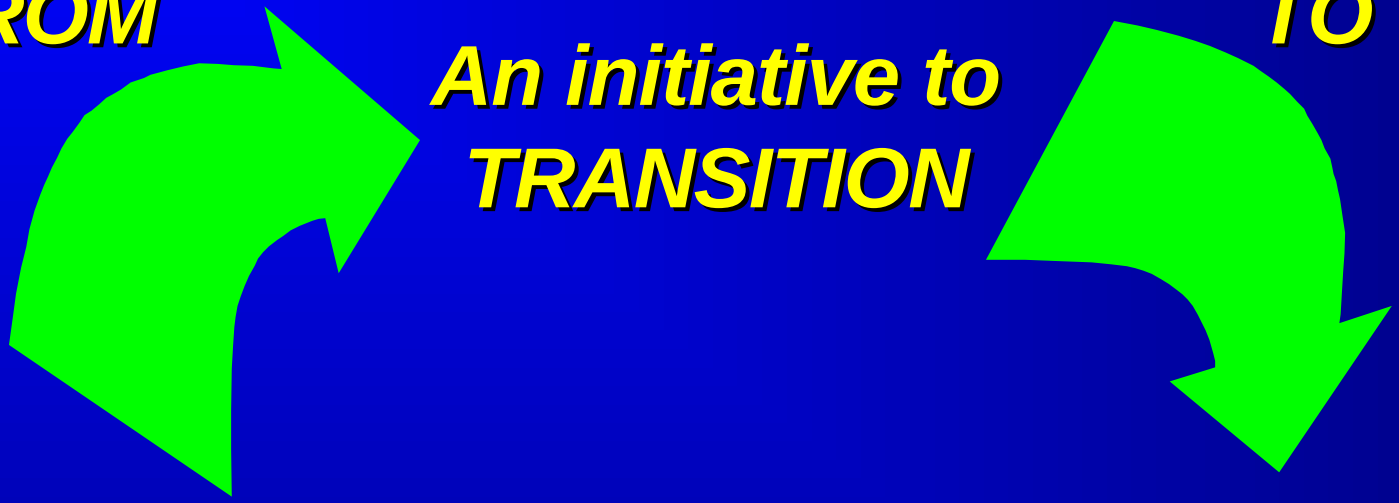
CALS

Continuous Acquisition and Life-cycle Support

FROM

An initiative to TRANSITION

TO



Paper-intensive
Non-integrated
Business Processes

Digital Product Data
Integrated
Shared Data
Business Processes

Learn DoD's Environment

- Infrastructure Modernization
- Business Processes Improvement
- Legacy Technical Data Conversion
- Digital Data Acquisition

JCALS

- Joint Computer-aided Acquisition and Logistics Support (JCALS)
- Provides the backbone for the CALS infostructure
- Baseline building block of the larger DoD CALS initiative to modernize all aspects of DoD business processes
  - First functionality is database management connectivity and technical manuals
  - Future: acquisition, engineering,

JCALS (cont'd)

- Uses existing systems and data where possible
- Develops and implements an Integrated Weapon System Database (IWSDB)
- Implements government and industry interfaces to exchange technical information
- Accommodates interchange of all CALS standards and specification formats
- Develops a flexible architecture

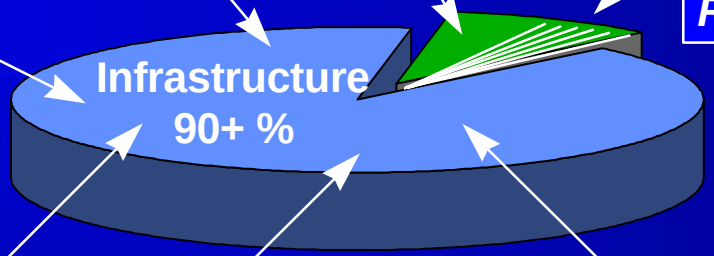
JCALS Technical Architecture

Engine
- Information Management
- Workflow Management
- Operating System

Technical Manual Functionality

Future Functionality Requirements

Integrated Weapon System Data Base (IWSDB)
- Data Dictionary/Directory
- Virtually Resident Data
- Reference Library
- Source Data



Generic Tool Box
- SGML Editors
- Illustrators/Graphics/ CAD/CAM
- Viewers

User Support
- Office Automation
- User Help
- E-Mail
- Desktop Workbench

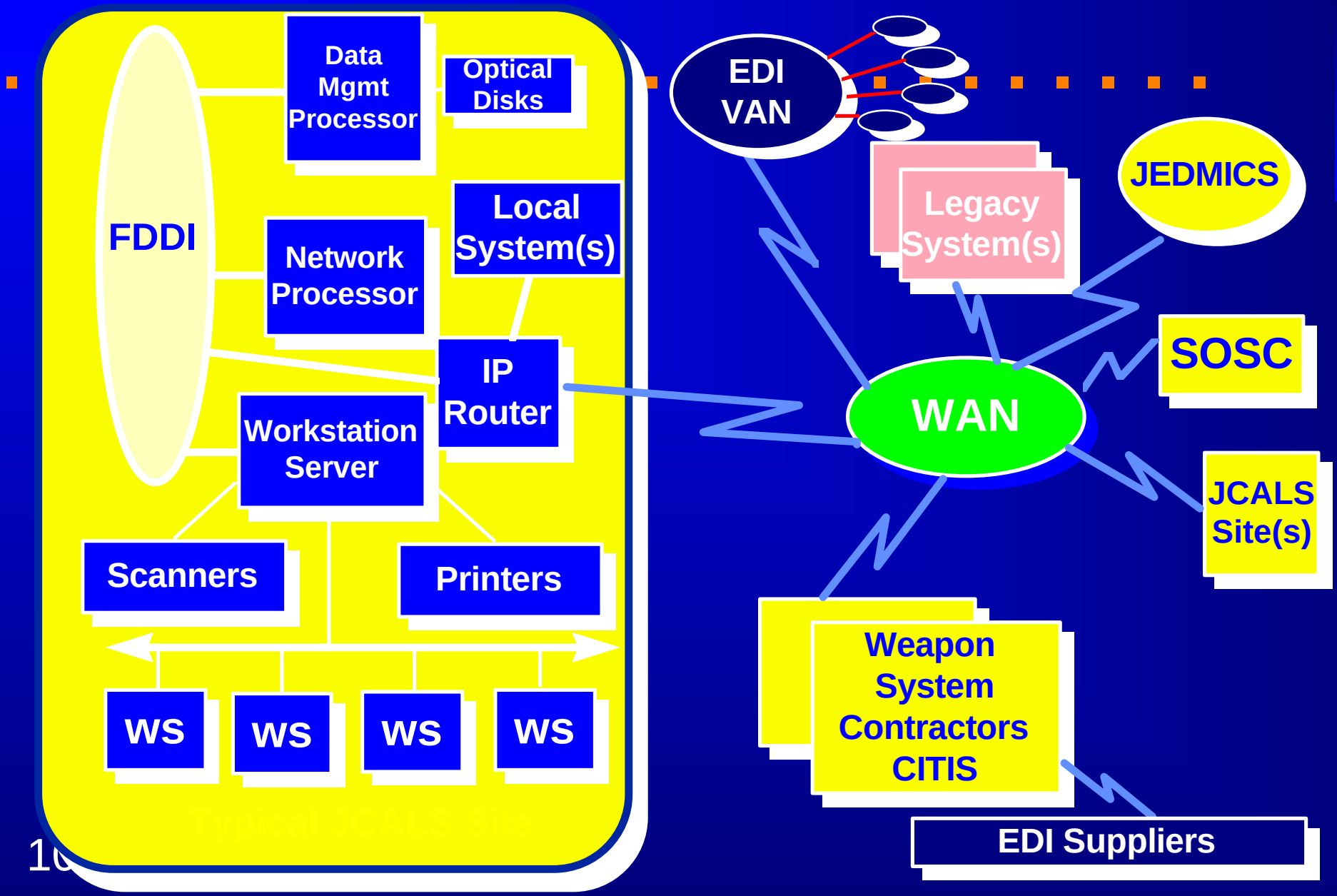
Telecommunications

System Administration

System Security

Data Base Management

Overview of the CALS Technical Architecture/JCALS



JEDMICS

- Joint Engineering Data Management Information and Control System (JEDMICS)
- Standard DoD program for managing approved engineering drawings and related technical data
- Replaces or supplements legacy drawing systems with a CALS compatible, DoD standard system
- Supports JCALS with standard repository management functionality

JEDMICS (cont'd)

- Standard repository management
- Management of intelligent data
- Global repository data management
- Incorporation of other engineering data types
- Accommodates data formats prepared IAW CALS standards and specifications

Integrated Product Data Environment

- A business environment
- Integrates standard DoD information systems
- Provides optimal digital data interchange
- Ensures easy access to data regardless of where data resides

Improve Business Processes

- Process improvements being accomplished in design, manufacturing, and support
- Re-engineered processes require modernized infrastructure

Improvement Equations

- Design processes + integrated databases
  - = Improved information quality
- Eliminate (duplicative + manual + error-prone) processes
  - = Reduced acquisition and support costs
- Digitize data
  - = Reduced space, weight, storage requirements
- Electronic (ordering + contracting)

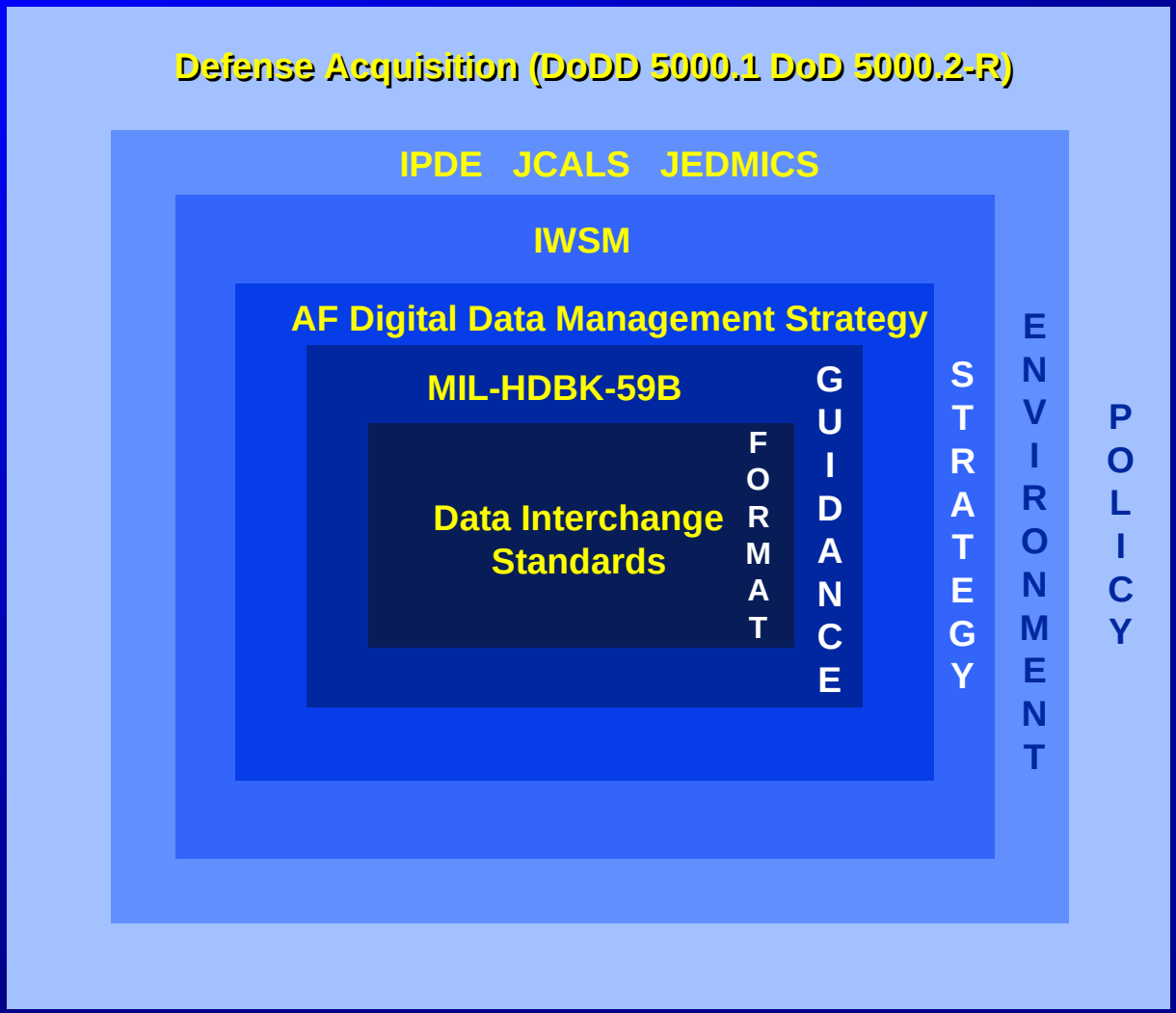
Legacy Data Conversion

- Legacy Air Force TOs to Indexed Portable Document Format (IPDF) file
  - JCALS compatible
  - COTS
  - Sponsored by DUSD(L)
- Higher intelligence conversion is encouraged

Digital Data Acquisition

- DoD 5000.2-R CALS/Digital Data Para. requires digital data access or delivery
- CALS standards and specifications provide the means for data interchange
  - Common interfaces
  - Neutral file formats

Acquisition Scaffolding



FACT SHEET

In a memorandum dated March 15, 1995, the Chairman of the Standards Improvement Council declared that the CALS standardization documents listed below are interface standards and performance specifications. They were among 13 information technology standards cited in the Chairman's memorandum. This important decision allows DoD organizations to use the CALS documents in their contracts without requesting waivers to the policy that steers DoD away from using non-performance military specifications. That policy was issued by Secretary of Defense Perry in June 1994.

MIL-STD-974	Contractor Integrated Technical Information Service (CITIS)
MIL-STD-1840B	Automated Interchange of Technical Information
MIL-D-28000A	Digital Representation for Communication of Product Data: Application Subsets and Application Protocols (IGES)
MIL-M-28001B	Markup Requirements & Generic Style Specification for Electronic Printed Output & Exchange of Text
MIL-R-28002B	Requirements for Raster Graphics Representation in Binary Format
MIL-D-28003A	Digital Representation for Communication of Illustration Data: Computer Graphics Metafile (CGM) Application Profile

Point of Contact:
DoD CALS Office
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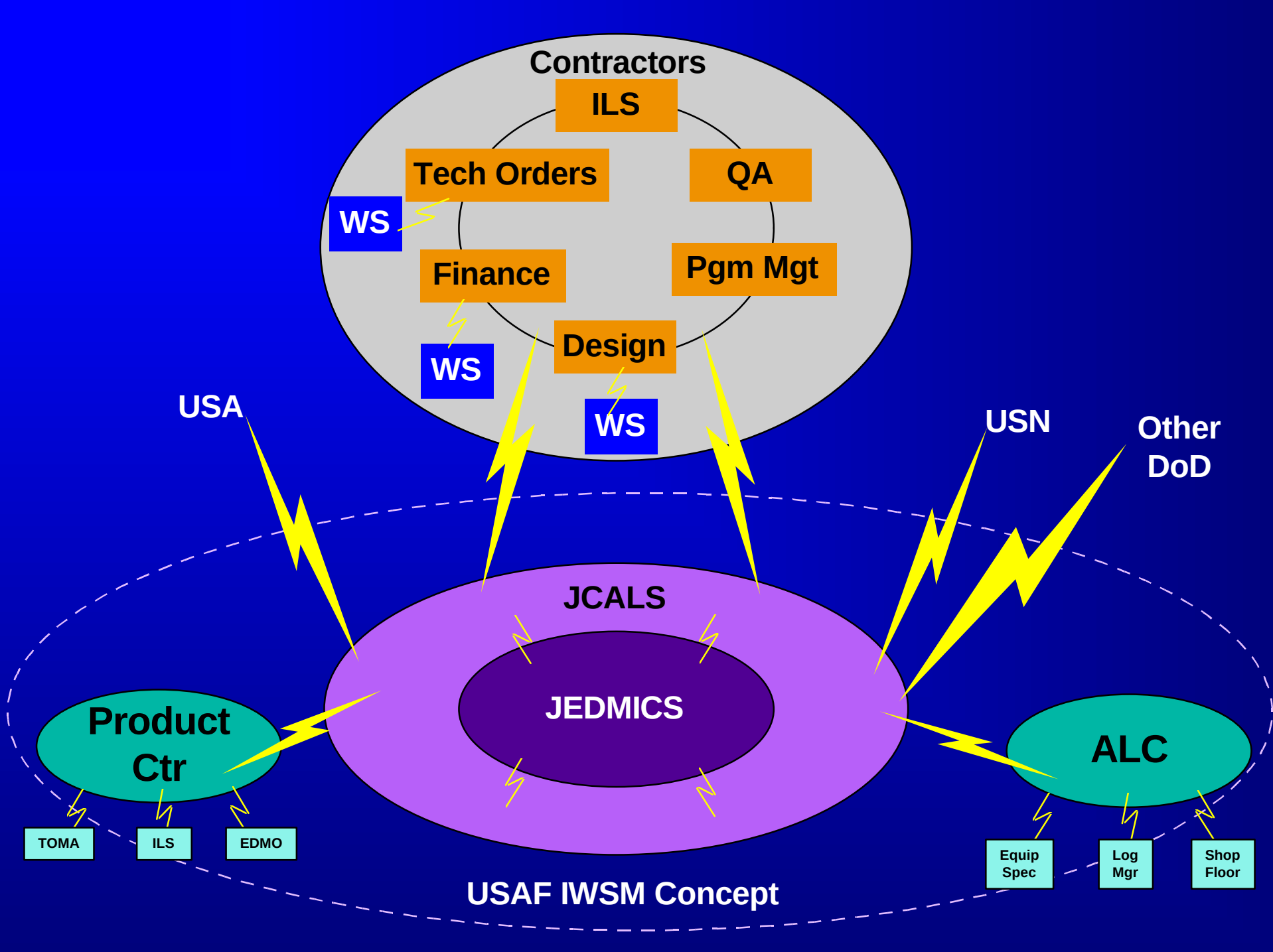
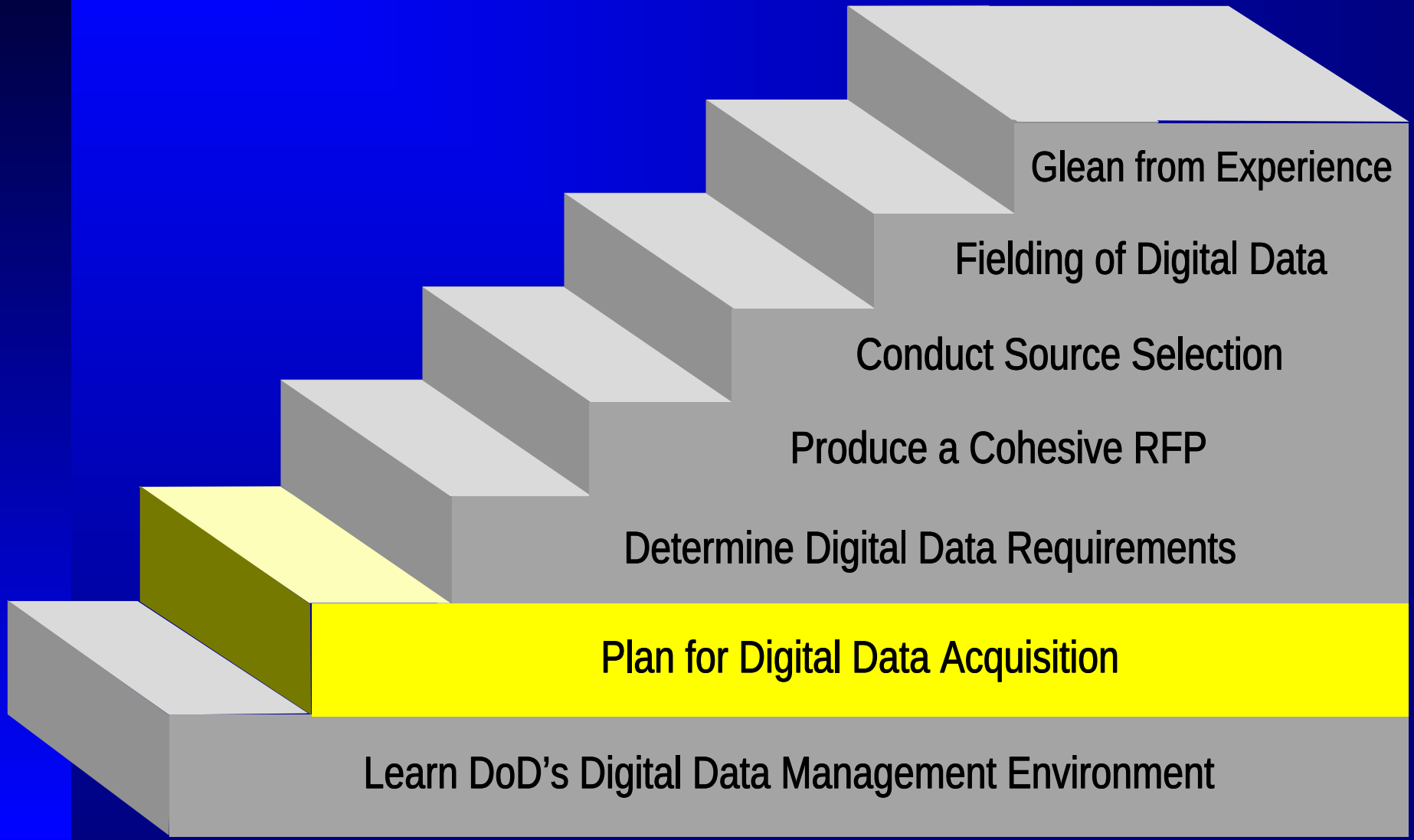
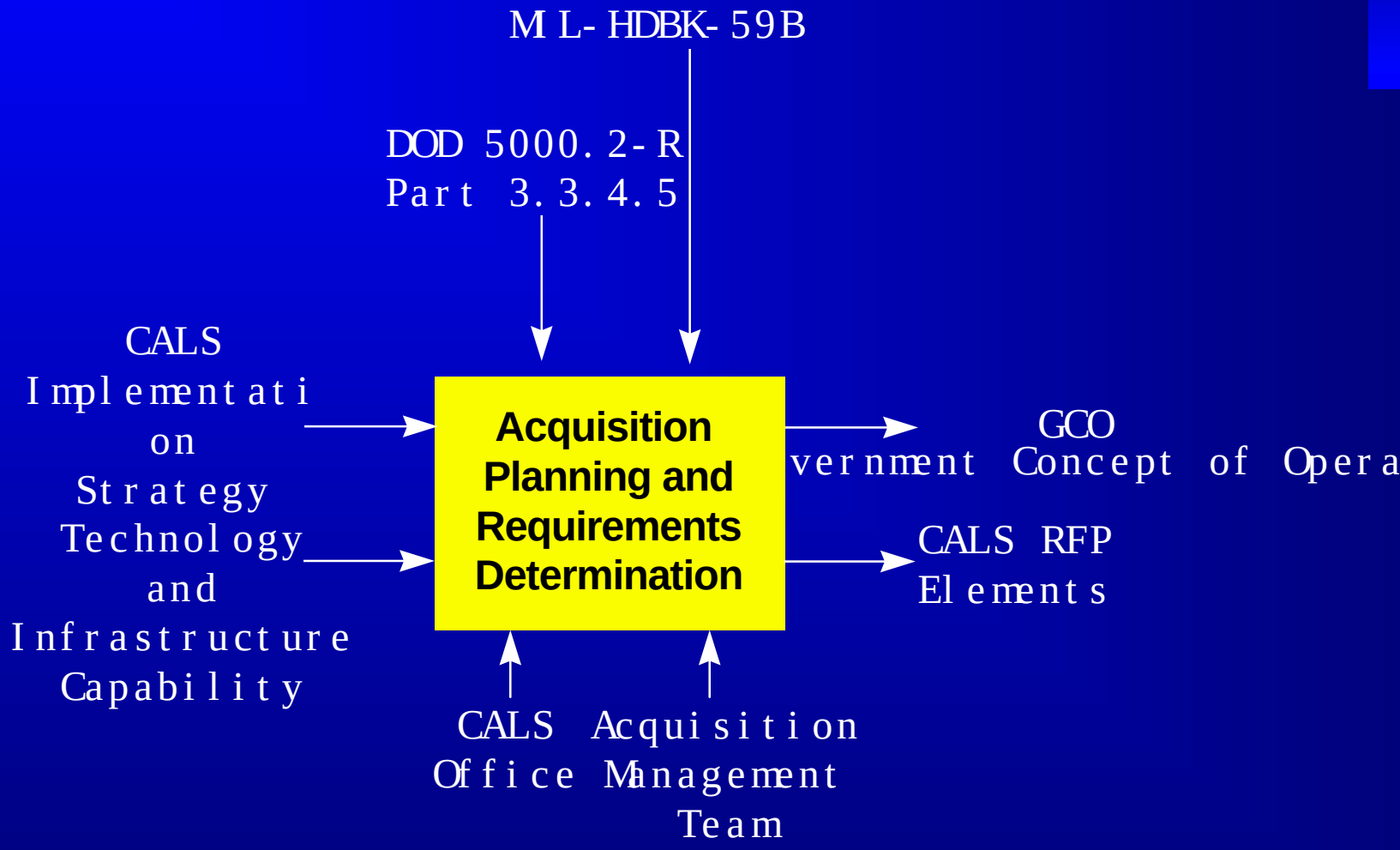
5203 Leesburg Pike, Suite 1609
Falls Church, VA 22041-3401
phone: (703)756-8464
fax: (703)756-5682
e-mail: sbrookin@acq.osd.mil


Contractors
ILS
Tech Orders
QA
WS
Finance
Pgm Mgt
Design
WS
WS
USA
USN
Other DoD
JCALS
JEDMICS
Product Ctr
ALC
TOMA
ILS
EDMO
Equip Spec
Log Mgr
Shop Floor
USAF IWSM Concept

Digital Data Acquisition Steps



Planning and Requirements Determination



Plan for Acquisition

- Guidance
- Program Characteristics
- Digital Data Implementation Strategy
- Technology Infrastructure Assessment
- Digital Data Acquisition Team

Guidance

- DFARS Part 207.105
- DoDD 5000.1
- DoD 5000.2-R
- MIL-HDBK-59B
- Air Force Digital Data Strategy

DFARS

- Part 207.105 requires CALS implementation in the Acquisition Plan
- Sets framework for effective CALS implementation
  - Helps ensure harmonization of program plans
  - Provides basis for funding program infrastructure modernization early in acquisition process

DoDD 5000.1

- Establishes management approach for acquiring defense systems
- Directive for DoD 5000.2-R

DoD 5000.2-R

Part 3.3.4.5 (CALS) (Digital Data)

Beginning in FY97, all new contracts shall **require on-line access to, or delivery of, their programmatic and technical data** in digital form, unless analysis shows that life-cycle time or life-cycle costs would be increased by doing so. **Preference** shall be given **to on-line access** to contractor developed data through contractor information services rather than data delivery. No on-going contract, including negotiated or priced options, shall be renegotiated solely to require the use of digital data, unless analysis shows that life-cycle costs would be reduced.

Acquisition strategies and plans shall describe the extent of implementation of these requirements in accordance with DFARS 207.105 . Solicitations shall require specific proposals for an **integrated data environment to support systems engineering and logistics**

DoD 5000.2-R

Part 4.3.3
(Data Management)

Data requirements shall be consi
equirements of other program
functional specialties to
minimize data redundancies and
inconsistencies.

MIL-HDBK-59B

- Presents detailed guidance regarding CALS implementation
- Assists in producing contractual documents for digital deliverables
- Defines and provides instructions for producing the CALS Government Concept of Operations (GCO)
- Defines DoD's digital data management infrastructure
- Defines CALS-related acronyms, definitions, and points of contact

AF Digital Data Strategy
(TO Acquisition)

- Assumptions
  - TO Integrity will be maintained
  - These are minimum acquisition requirements
  - Some users may require paper and digital TOs
  - ATOS and G022 processes will operate until JCALS is fielded

AF Digital Data Strategy
(TO Acquisition)

- Development
  - Have TOs tagged in the Standard Generalized Markup Language (SGML) format
  - Use AF content specific Document Type Definitions (DTDs) *Contact AF PDSM Program Office*
  - Require a business case if contractor wants to develop TOs in a native format
  - Interactive Electronic Tech Manuals (IETMs) should be developed IAW DoD performance spec

AF Digital Data Strategy
(Delivery of Organically Maintained TOs)

- Prior to JCALS implementation
  - Contractor should deliver Indexed Portable Document Format (IPDF) files of SGML-authored TO
  - For on-line access of TOs use Contractor Integrated Technical Information Service (CITIS) contract IAW MIL-STD-974

AF Digital Data Strategy
(Delivery of Organically Maintained TOs)

- After JCALS Implementation
  - Contractor should deliver SGML-formatted TOs
  - Contractor should deliver the appropriate and AF PDSM Program Office approved DTD
  - Delivery of SGML tagged instances of the TOs should include the IGES, CGM, or RASTER graphics files
  - CITIS should allow government access to SGML TOs

AF Digital Data Strategy
(Access to Contractor Maintained TOs)

- CITIS should be employed
- Contractor data should be accessable for view and distribution in IPDF format
- If contractor source data is ever delivered to the government, then deliver in SGML
- This information should be in the CDRL

Indexed Portable Document Format (IPDF)

- COTS Page Description Language
- Cost effective, platform independent
- Intelligent file format
- Retains page fidelity
- Produces searchable, compact, and easy to distribute files
- Interim step to more intelligent Tech Orders

Digital Data Acquisition

- Engineering Data
  - Deliveries should be in a CALS format identified in the current version of ML-STD-1840 and in a format compatible with the user's digital engineering data repository

Legacy Data Conversion

- Technical Orders
  - Intermediate step: Conversion of organic TOs to IPDF files while awaiting maturity of CALS standards and JCALS
  - High change frequency TOs will be SGML-tagged when DTDs become updated
- Engineering Data
  - Convert legacy data to CALS standard formats (JEDMICS formats)

Program Characteristics

- Acquisition Phase
- Data User Infrastructure
- Operational Requirements
- Acquisition Strategy
- Single Acquisition Management Plan

Acquisition Phase

- CALS in strategic planning documents
- RFP package requires digital product data delivery/access
- Data intelligence will increase throughout acquisition process
- Infrastructure must be definitized with a view to using existing/modified information systems
- Treat modifications as acquisitions

Data User Infrastructure

- Identify the data users
- Identify how users will access data
- Identify user hardware, software, telecommunications, and peripheral equipment
- Record in the CALS Government Concept of Operations (GCO)

Operational Requirements Document (ORD)

"**All** defense system **technical data**, including technical orders and engineering data, generated in support of the acquisition life-cycle **shall be exchanged in digital form**. CALS **digital data** standards **shall be an integral part of** the program's acquisition and logistics data **acquisition strategy**. MIL-HDBK-59B provides guidance on structuring a CALS program. Until a commercial equivalent is available and accepted, MIL-STD-1840B and MIL-STD-974 shall be used to provide guidance on technical data delivered to the government and to establish

Acquisition Strategy

"The [XYZ] program will take advantage of existing and emerging automation and integration capabilities to establish a computer-based environment for creating, managing and storing data elements once for multiple applications across engineering, design, manufacturing and logistics functions and processes. The program will stress concurrent engineering, digital data delivery and on-line electronic information services in the solicitation process and resulting contract(s). Continuous Acquisition and

Single Acquisition Management Plan

"The [XYZ] project intends to implement CALS initiatives to reduce life cycle costs, improve product quality, reduce program risk and reduce the schedule of the design, development and production. The technical information required in support of the project will be made accessible through on-line contractor integrated technical information (electronic) services; physical delivery of data required for sustaining support activities will be in accordance with approved MIL-STD-1840 (CALS) format standards and specifications. For contract data requirements not evaluated as cost-effectively delivered to the CALS standards/specifications, delivery will be in mutually agreeable digital formats.

Acquisition Reform

- Integrated Master Plan (IMP)
- Statement of Objectives (SOO) / Statement of Work (SOW)
- Responsibilities from Acquisition Reform

Integrated Master Plan

- Replaces the System Engineering Master Plan
- Developed by the offeror in response to SOO, ITO, and Evaluation Criteria sections of RFP
- Event driven
- Source selection material for government
- Describes entrance and exit criteria for all events
  - TO Reviews, TO Val/Ver, TO delivery

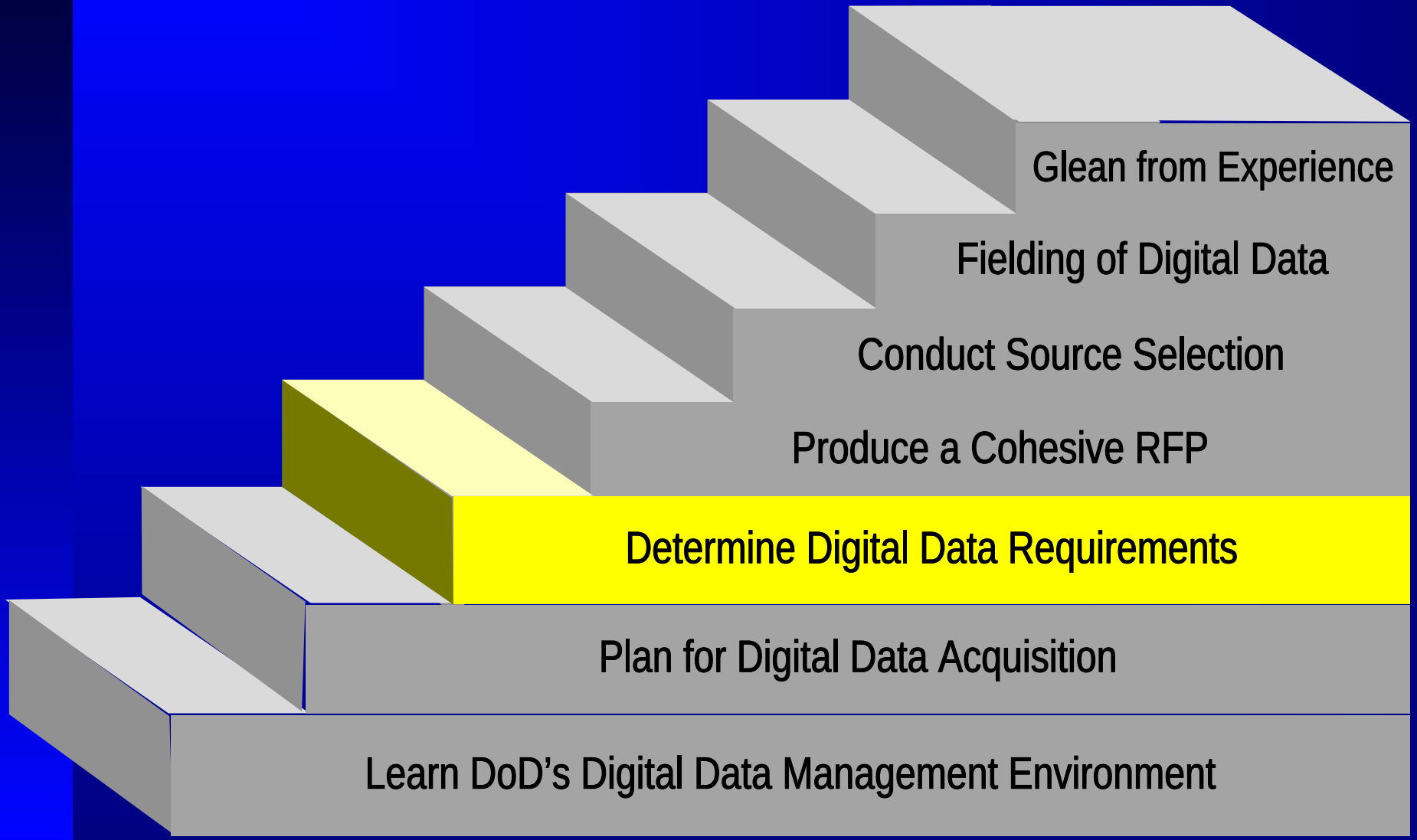
SOO/SOW

- 2-4 pages, clear, and concise
- Provides basic, top-level objectives of the program
- Referenced in RFP ITO and Evaluation Criteria Sections
- Is coordinated with the program MNS, ORD, SRD, and draft WBS
- Offeror builds a SOW and CDRL package from SOO
- Replaced at contract award by the SOW
- Govt builds the SOW only in

Responsibilities from Acquisition Reform

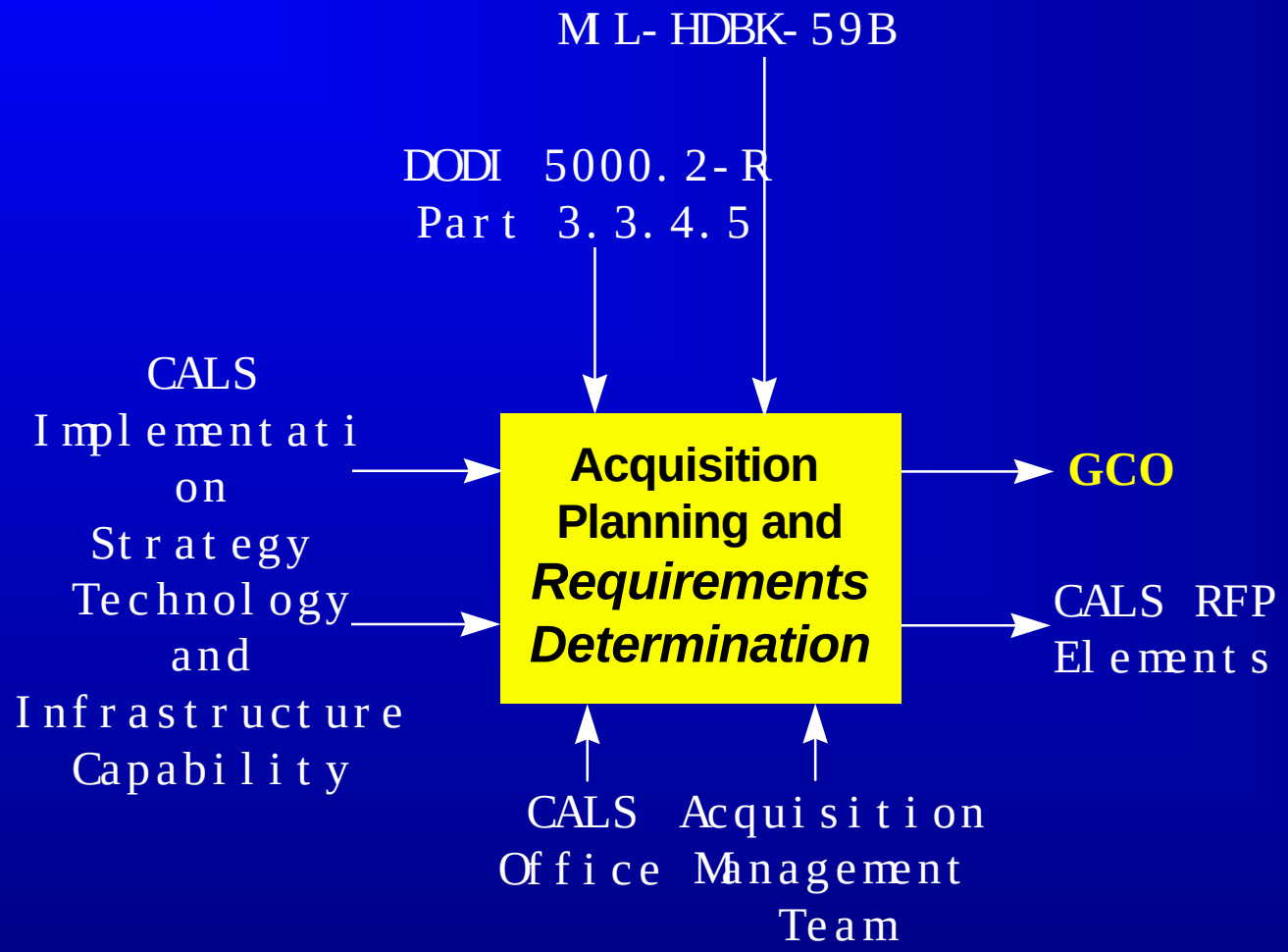
- Government
  - Produce RFP
  - Produce SOO, or in exceptional cases SOW
  - Assemble knowledgeable source selection team
- Offeror/s
  - Produce IMP
  - Produce the SOW, WBS, other related documents
  - Produce the Proposal including IMP and SOW IAW other RFP criteria (i.e., ITO, Evaluation Criteria, etc.)

Digital Data Acquisition Steps



Determine Requirements:

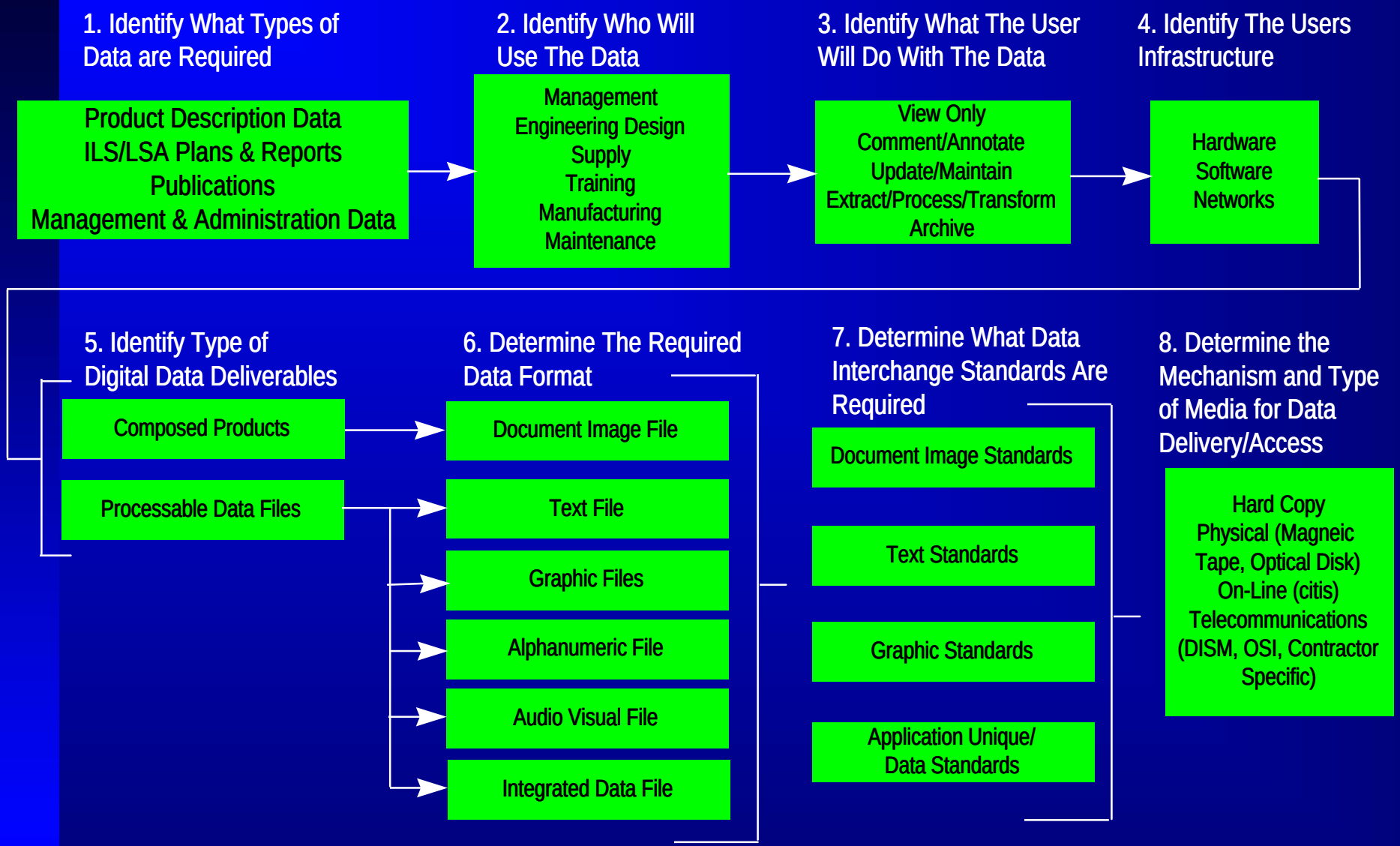
Government Concept of Operations (GCO)



CALS GCO

- Describes the government's infrastructure and CALS implementation strategy to potential offerors
- Government produced IAW ML-HDBK-59B and TO 00-5-3
- Is an Attachment to the RFP (Government Furnished Information)
- Source data for the Contractor's Proposal
- Used to steer the CALS effort
- Allows the government to match

GCO Elements



Types of Data Deliverables

MANAGEMENT AND ADMINISTRATION DATA

Program Schedules/Master Schedule
Contractual Vehicles
Conference Agendas/Minutes
Contract Work Breakdown Structure
Management Information System Plan
Configuration Management Plan
System Engineering Management Plan
CALS Implementation Plan (CALSIP)

PRODUCT DESCRIPTION DATA

Technical Data Package
System Specifications
Engineering Drawings/Associated Lists
Test Data
ECP, RFW, and RFD
Product Specification

ILS/LSA PLANS AND REPORTS

Integrated Logistics Support Plan (ILSP)
Logistics Support Analysis Plan (LSAP)
Logistics Support Analysis Record (LSAR)
Reliability Assessment Reports
Level of Repair Analysis (LORA)
Test and Evaluation Master Plan
Life-Cycle Cost Estimates
Environmental Impact Report
Technical Report-Study Services
Quality Program Plan

PUBLICATIONS

Technical Publications
Technical Manuals
User's Manuals
Operations Manuals

Who Will Use the Data?

ACTIVITY	LOCATION	FUNCTION	DATA REQ
AF Materiel Command	WPAFB	Design Agent	Eng. Data Eng. Drawings R&M Data Reports/Plans
		ILS	LSAR Data Tech Pubs Reports/Plans R&M Data Provisioning Data ILS/LSA Data
		Training	Trn Planning Data Trn Materials Manpower Rqmts

What Will the User Do With the Data?

Data Types	DID	ACQ MGR	QA	Tech Data
SW Test Plan	DI-MCCR-80014A	C, E, A		
Tech Data Pkg	MIL-T-31000	C	C	C

V = View Only
U = Update/Maintain
A= Archive
E = Extract/Process/Transform
C = Comment/Annotate

What Is the User's Infrastructure?

Table E-III XXX Program user capabilities

USER	FUNCTION	HARDWARE	SOFTWARE	NETWORKS
Location A	Program Management	Desk Top Publisher	S/W Applications 1, 2 and 3	Desk Top Publisher
	Configuration Management	PC	S/W Application 1	Modem
	Class Desk	Desk Top Publisher	S/W Applications 1, 2 and 3	LAN MGR 1
				E-mail
	Program Office, Engineering	Desk Top Publisher	S/W Applications 1, 2 and 4	LAN MGR 3
Location B	ILS	PC Compatibles Type 1	S/W Application 2	LAN MGR 3
		Workstation Type 1	S/W Application 1	E-mail
Location C	Participating Matrix Codes (Engineering, Cost Analysis Product Assurance)	PC Compatibles	S/W Applications 1, 2 and 5	LAN MGR 3
		Desk Top Publisher	S/W Applications 1 and 2	E-mail
		Workstation Types	S/W Applications	
		1, 2 and 3		
	Service Center	PC Compatibles	S/W Application 2	LAN MGR 2
		Desk Top Publisher	S/W Application 1	Modem
		Plotter, Type 1	S/W Application 1	
		Work Station	S/W Applications 1 and 2	
Location D	ILS	PC	S/W Applications 1, 2 and 3	LAN MGR 1
				E-mail
Location E	Training	PC	S/W Applications 2, 5 and 6	E-mail
			Graphics S/W application 2	

What Data Formats?

- Composed Products:
  - Document image file
- Processable Data Files:
  - Text file
  - Graphics file
  - CAD files
  - Product data files
  - Integrated data file (Integrated Electronic Tech Manuals {IETMS})

What Data Interchange Formats and Standards?

- MIL-STD-1840B
  - Initial Graphics Exchange Specification (IGES)
  - Standard Generalized Markup Language (SGML)
  - Raster
  - Computer Graphics Metafile (CGM)
  - Electronic Design Interchange Format (EDIF)
  - Standard Exchange for Product Data (STEP)
  - Very High Speed Integrated Circuit (VHSIC) Hardware Description Language (VHDL)

Automated Interchange of Technical Information

MIL-STD-1840B

- Defines exchange formats for digital data
- Standardizes transfer unit types
  - SGML document transfer unit
  - Product data transfer unit
- Standardizes delivery format for digital data
- Requires reference in the Statement of Objectives and CDRL
- Provides instructional approach

IGES

- MIL-PRF-28000: Initial Graphics Exchange Specification (IGES)
- Neutral file format for representation and transfer of product definition data
- Used on CAD/CAM/CAE systems and application programs

IGES

- IGES graphic classes
  - Technical Illustrations
  - Engineering Drawings
  - Machine Tool Path
  - 3D Piping Application Protocol

SGML

- MIL-PRF-28001: Standard Generalized Markup Language (SGML)
  - Instructions for DTD development
  - Includes a Document Type Definition format
  - Defines ISO 8879 as baseline
- Specifies the format and structure of page-oriented technical publications
  - Documents based on MIL-M-38784 (DTD)

SGML

- Provides user with:
  - Easy information cross-referencing
  - Quick and easy information locating
  - Storage space savings since SGML is least demanding of all digital forms
  - Easily updated and easy accessible records

Raster

- MIL-PRF-28002A: Raster Graphics Representation in Binary Format
- Definition: Binary coded representation of an image
  - Type I untiled image
  - Type II untiled and tiled images (Good for large files)
- Used for storage and interchange of scanned engineering drawings, tech orders, and illustrations

CGM

- MIL-PRF-28003: Computer Graphics Metafile
- Specifies device-independent, digitally-encoded vector graphics data; easily previewed, modifiable;
- Used for storage, retrieval, and interchange of 2-D vector and/or mixed Raster/vector picture description information
- Supports color graphics
- Preferred TO illustration format

STEP

- Standard Exchange of Product Model Data (ISO 10303)
- Enables neutral interchange of a product's life-cycle data
- Users can transfer complete product life-cycle data files among heterogeneous, advanced CAD/CAM systems

STEP will integrate CAD/CAM files containing design data with other information related to specific items or parts (e.g., logistics support and packaging information). This will dramatically change the way enterprises organize, describe, and view data. The impact on data management will be similar to that of object-oriented technology. Data that is

CITIS

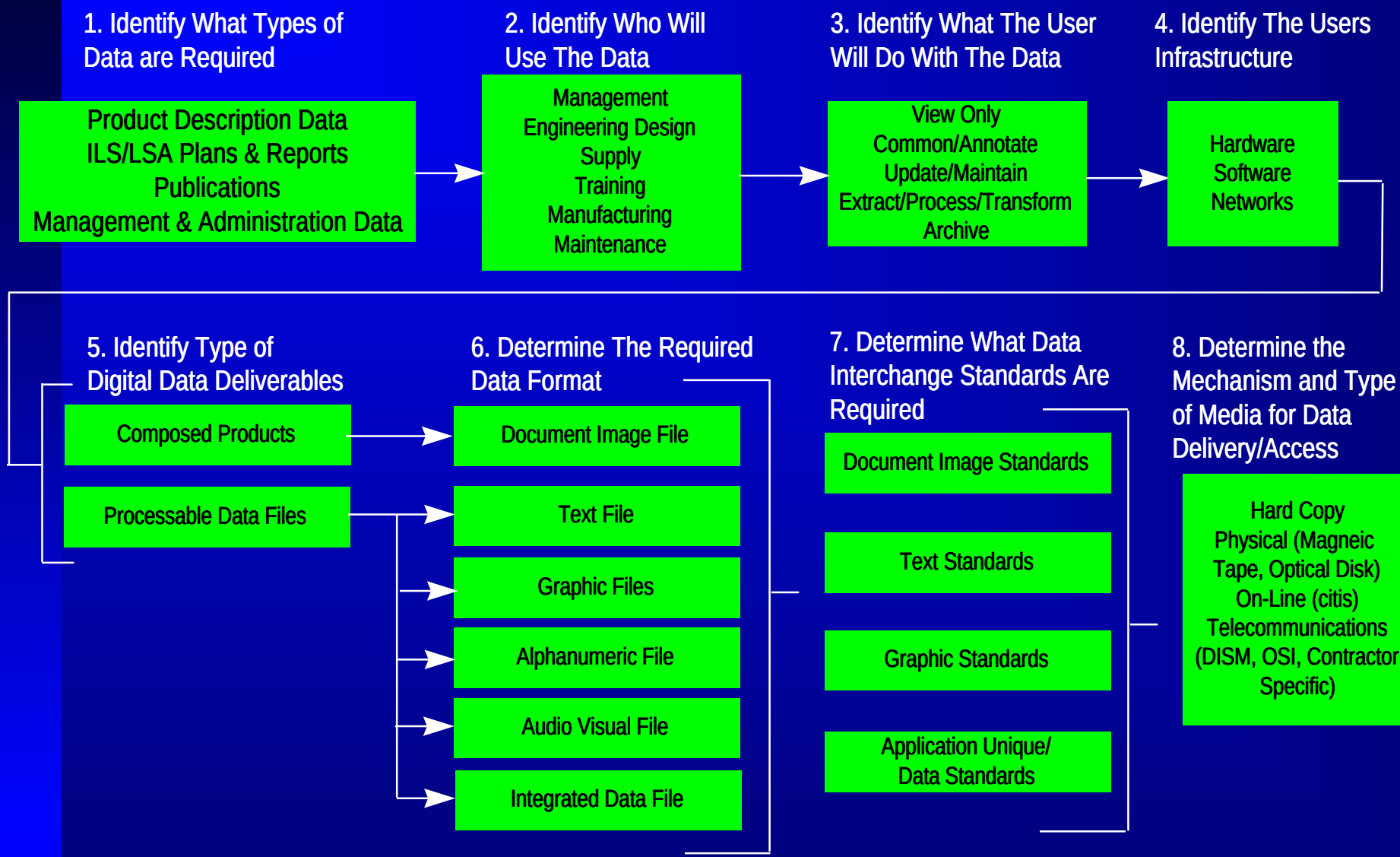
MIL-STD-974

- On-line access to contractor-maintained and/or owned databases and applications
- File transfer capability for upload and download
- Electronic mail compatible with the government e-mail system(s)
- TCP/IP compliant
- Currently supports unclassified data

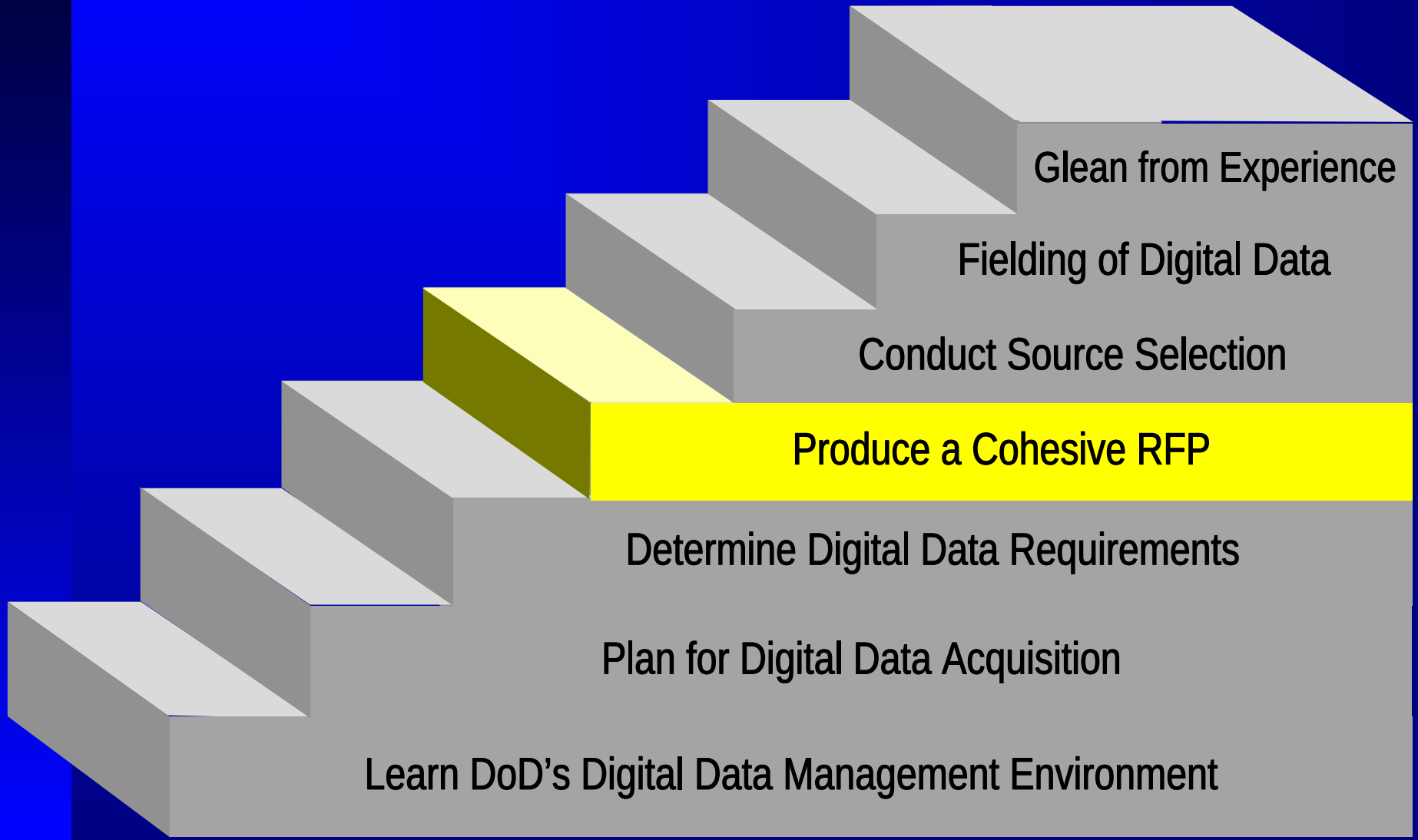
What Data Delivery Media Type?

- Physical delivery
  - Magnetic tape
  - Magnetic disk
  - Optical disk
- On-line delivery
  - Telecommunications download
  - Data items stored and maintained at contractor's site
- On-line access
  - CITIS

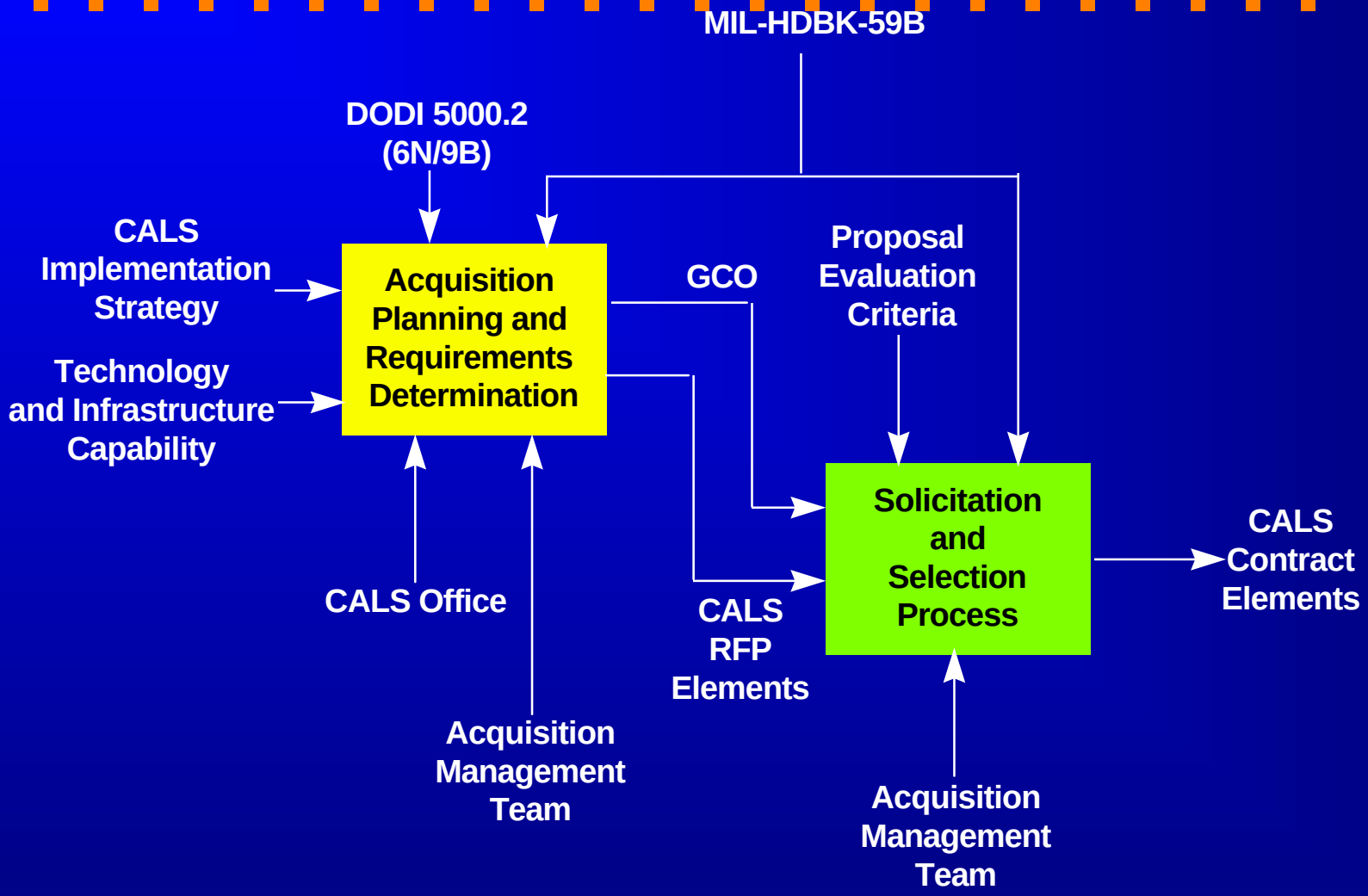
GCO Summary


1. Identify What Types of Data are Required
Product Description Data
ILS/LSA Plans & Reports
Publications
Management & Administration Data
2. Identify Who Will Use The Data
Management
Engineering Design
Supply
Training
Manufacturing
Maintenance
3. Identify What The User Will Do With The Data
View Only
Common/Annotate
Update/Maintain
Extract/Process/Transform
Archive
4. Identify The Users Infrastructure
Hardware
Software
Networks
5. Identify Type of Digital Data Deliverables
Composed Products
Processable Data Files
6. Determine The Required Data Format
Document Image File
Text File
Graphic Files
Alphanumeric File
Audio Visual File
Integrated Data File
7. Determine What Data Interchange Standards Are Required
Document Image Standards
Text Standards
Graphic Standards
Application Unique/ Data Standards
8. Determine the Mechanism and Type of Media for Data Delivery/Access
Hard Copy
Physical (Magneic Tape, Optical Disk)
On-Line (citis)
Telecommunications (DISM, OSI, Contractor Specific)

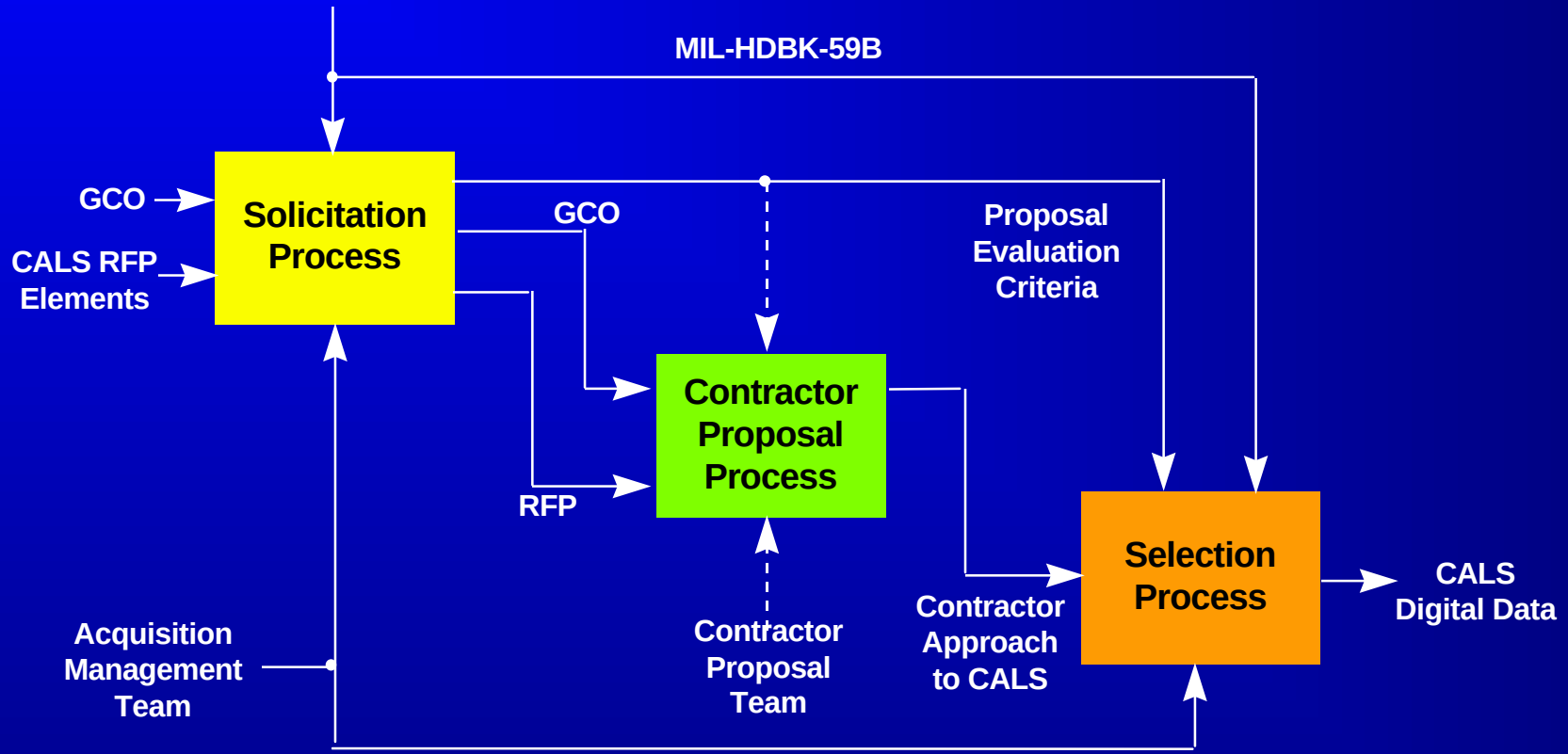
Digital Data Acquisition Steps



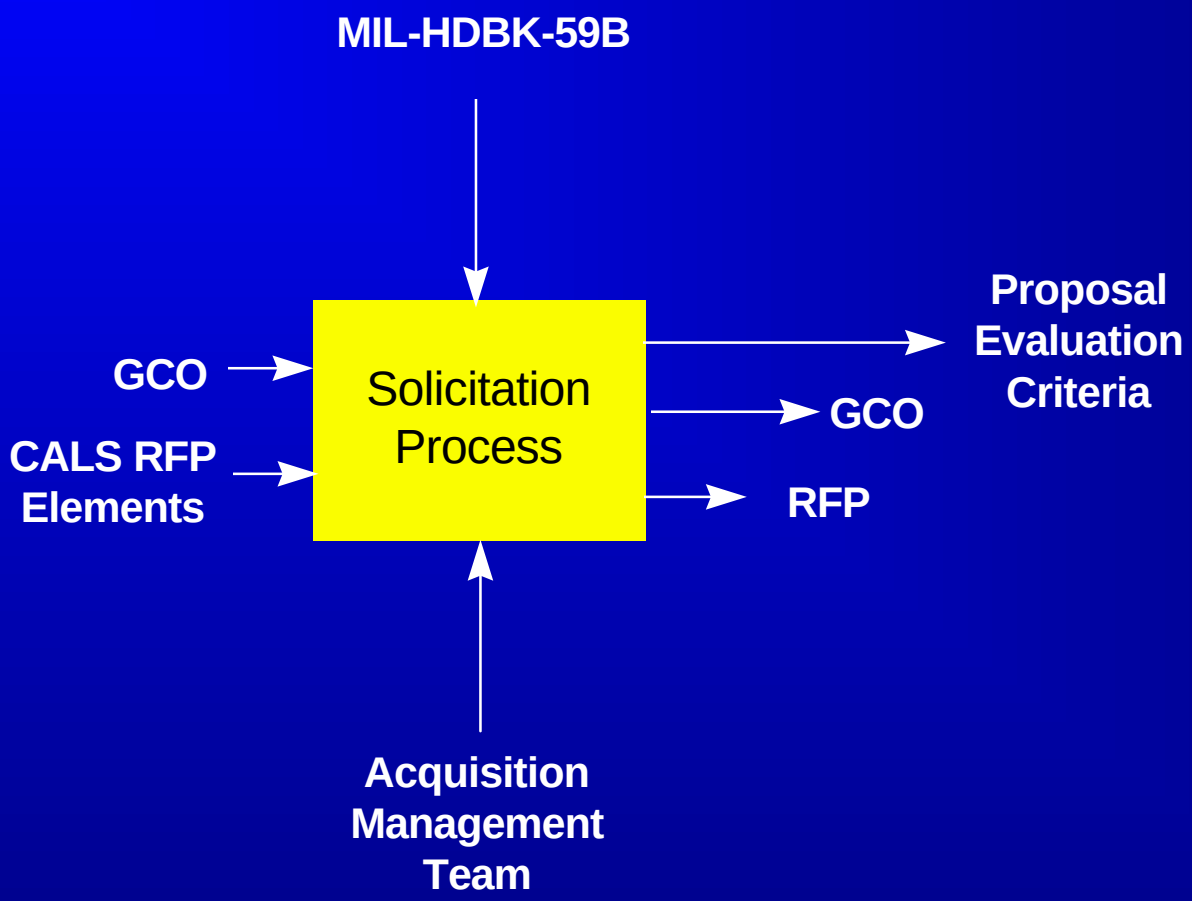
Solicitation and Selection



Solicitation and Selection



Solicitation Process



RFP Development

- RFP Defines:
  - Scope of work
  - Schedule
  - Conditions and clauses
  - Instructions and evaluation criteria
  - Deliverables

RFP Development

- RFP Source Material
  - GCO
  - CALS Implementation Strategy
  - Acquisition Strategy
- Requires acquisition team participation
  - Cohesiveness
  - Integrated approach

RFP Section B

Supplies of Services and Prices/Costs

- TOs require separate CLIN and sub-CLINs
  - With or without an attached TM-86-01
- CITIS should be separate CLIN
  - Permits cost/benefit analysis
  - Permits visibility of CITIS schedule
- CITIS CLIN should contain following elements:
  - Service establishment and telecommunications
  - Access/connect time and security
  - Contractor infrastructure and

CLIN Example

"Technical Orders for the XYZ program are to be prepared in accordance with Exhibit A."

Exhibit A: TMCR

Flight Manual Deliverables

O-level Maintenance Deliverables

Depot TOs

TO Management Deliverables

CLIN Example

ITEM NO.	SUPPLIES/SERVICES	QTY	UNIT PRICE	AMOUNT
0002	Tech. Data Package (TDP) for CLIN 0001 in accordance with Exhibit A.	1 EA	$XXXXX*	$XXXXX*

*Provided by offerors responding to a solicitation; final contract amounts inserted by contracting officer.

Contractor's CLIN Proposal

- A tailored and revised TM-86-01
  - Contains completed Section 2 (Manuals required)
  - Contains completed Section 3, Specification Interface Requirements (formerly Specification Application Record (SAR)
    - Only joint-service TMSS' will be included in the revised TM-86-01 SAR

RFP Section C
Statement of Objectives

- Digital Product Data Delivery
  - Acquiring Tech Orders (TOs)
  - Acquiring Engineering Drawings
- CITIS

Acquiring Technical Orders (TOs)

- Knowledgeable TO Management Agency (TOMA)
- Trained TO acquisition team
- Knowledge of program's TO requirements
- MIL-HDBK-59B Decision Template
- A separate TO CLIN and exhibit (TMCR)

3-3 INITIAL PLANNING.

The TOMA for an acquisition program must be established as early as possible to develop cost management planning requirements and inputs to the Statement of Objectives (SOO) and Instructions to Offerers (ITO) sections of the Request for Proposal (RFP) (chapter 4).

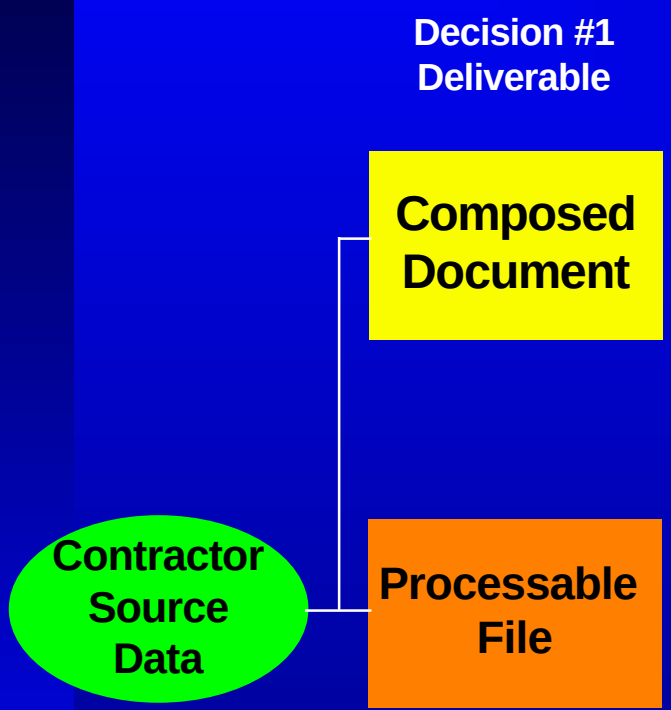
3-3.1 The TOMA will review the Mission Need Statement (MNS), Program Management Directive (PMD), Operational Concept, Maintenance Concept, TO MILSPECs, and other tasking documents to develop a preliminary TO Management Plan (TOMP) and wording for the SOO and ITO.

3-3.1.1 The SOO should specify TO requirements in performance-based terminology. The ITO must be explicit enough to allow the contractor to tailor a TMCR for submittal with the proposal. Evaluation criteria (RFP section M) must support the SOO and ITO sections.

Acquiring TOs

- A Statement of Objectives or, in limited cases, a Statement of Work tasking
- Submit the GCO as GFI (See TO 00-5-3 Chap 4)
- Instructions to Offeror (ITO) language asking for priced options (See TO 00-5-3 Appendix E)
- A well-tailored Technical Manual Contract Requirements (TMCR) - TM-86-01E

MIL-HDBK-59B Decision Template - # 1



Delivery Type Options

- Composed TOs
  - Type A = Direct image copy
  - Type B = Type A delivered digitally
    - Raster products
    - Page Description Language (PDL)
    - Word processor
- Processable TOs
  - Type B+ = i.e., tagged data (IGES and SGML)
  - Type C = task oriented tagging, input to database for IETM stored in a relational database
- Program can acquire interim dual

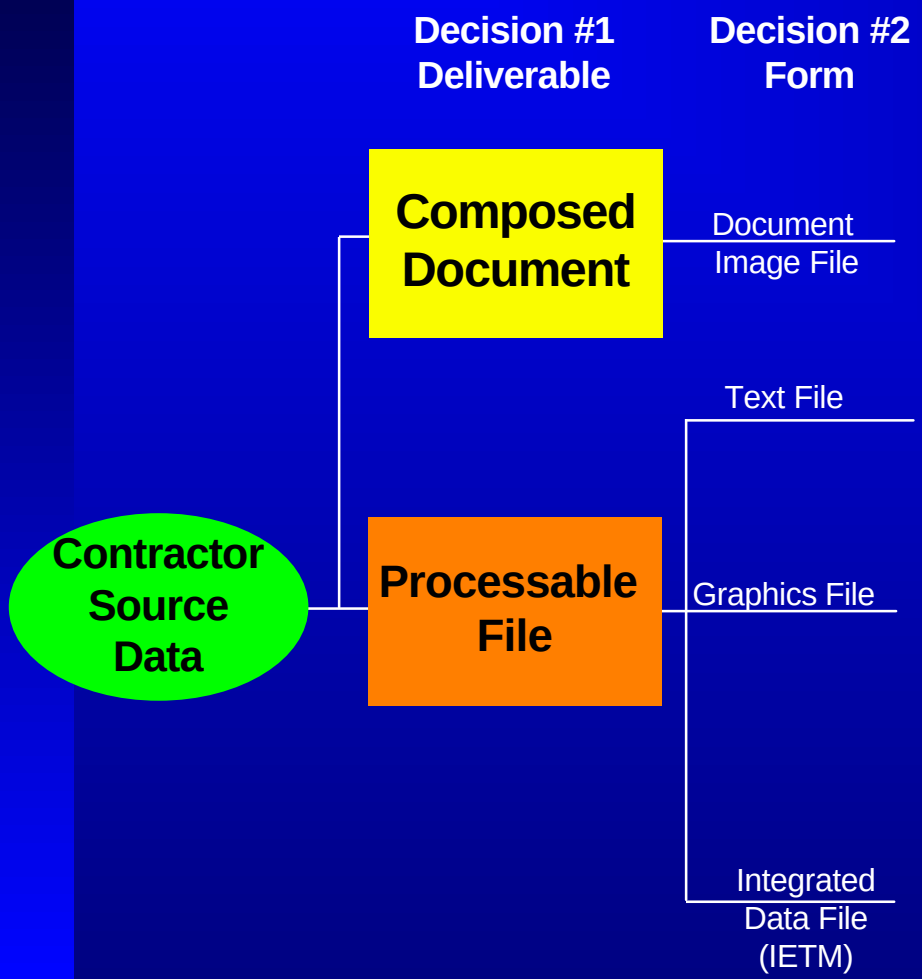
Composed TOs

- Offers least flexibility
- Non-changeable without further processing
- Can be archived, viewed, printed

Processable TOs

- Robust
- Can be updated
- Can be transformed to many data types
- Provides interactive, WORM capability

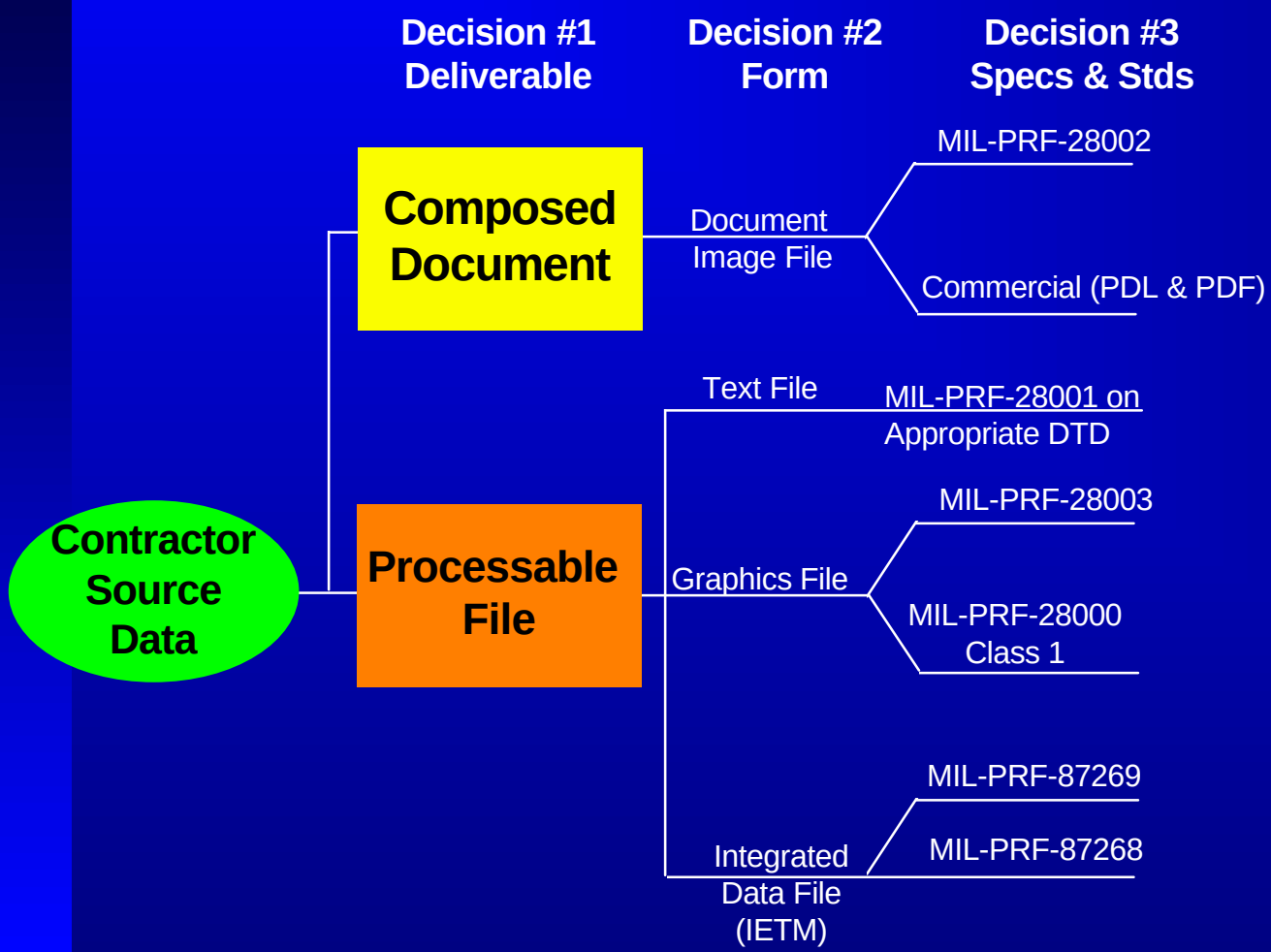
MIL-HDBK-59B
Decision Template # 2



Form Options

- Document Image file
  - Raster file
  - Page Description Language file
  - Acquire as interim solution only
  - Accommodates legacy data conversion
- Text File
  - SGML-tagged
  - Commercial word processing
- Graphics File
- Integrated Data File
  - Text and Graphics in compound architecture

MIL-HDBK-59B Decision Template # 3



Specs and Standards

- Document Image File
  - MIL-P-38790 (Direct image copy)
  - MIL-PRF-28002 (Raster)
  - Commercial (i.e., PDL and PDF)
- Text File
  - MIL-PRF-28001 (SGML), DTD, FOSI
  - Commercial word processing

Document Type Definitions

- Set of rules governing how TO data is tagged
- Appended to each MILSPEC for each TO type
- Conform to each TO type (i.e., flight manual)
- AF PDSM Program Office is OPR for AF DTDs
- Used to produce a tagged instance of the TO
- DTD structure appended to MIL-PRF-28001 (SGML)

DTD Example (Tagged Instance)

```
<doc service="NAVY" docid="S9086-RQ-STM-010/CH-510"
   docstat="revision"
<front>
<!--                TITLE PAGE-->
<idinfo>
<tmidno>
<docno>S9086-RQ-STM-010/CH-510
<revnum>FIRST REVISION
<doctype>NAVAL SHIPS' TECHNICAL MANUAL
<prtitle>
<subject>
S9086-RQ-STM-010 <brk type="line">
HEATING, VENTILATING, AND AIR <brk type="line">
CONDITIONING SYSTEMS <brk type="line">
FOR SURFACE SHIPS
</prtitle>
<seal> <graphic boardno="D001R034" reprodep="100"
   reprowid="100">
<discl>
<distrib type="B"> DISTRIBUTION AUTHORIZED TO U.S.
   GOVERNMENT AGENCIES ONLY; ADMINISTRATIVE/OPERATIONAL
   USE; 28 FEBRUARY 1990.  OTHER REQUESTS FOR THIS
   DOCUMENT MUST BE REFERRED TO THE NAVAL SEA SYSTEMS
   COMMAND (SEA-09B2).
```

Formatted Output Specification Instance

- Translates tagged instance into desired output
- Supports a particular DTD for a particular TO type
- Contains formatting information (i.e., point size)
- Appended to governing MLSPEC
- Used with DTD to produce desired output
- Provided to the contractor as GFI
- Can be downloaded from AF PDSM

Specs and Standards

- Graphics File
  - MIL-PRF-28003 (CGM)
    - Preferred option for TOs
    - Smaller file size
    - Easily edited and maintained
  - MIL-PRF-28000 (IGES)
    - Text delivered in ASCII
  - MIL-PRF-28002 (Raster)

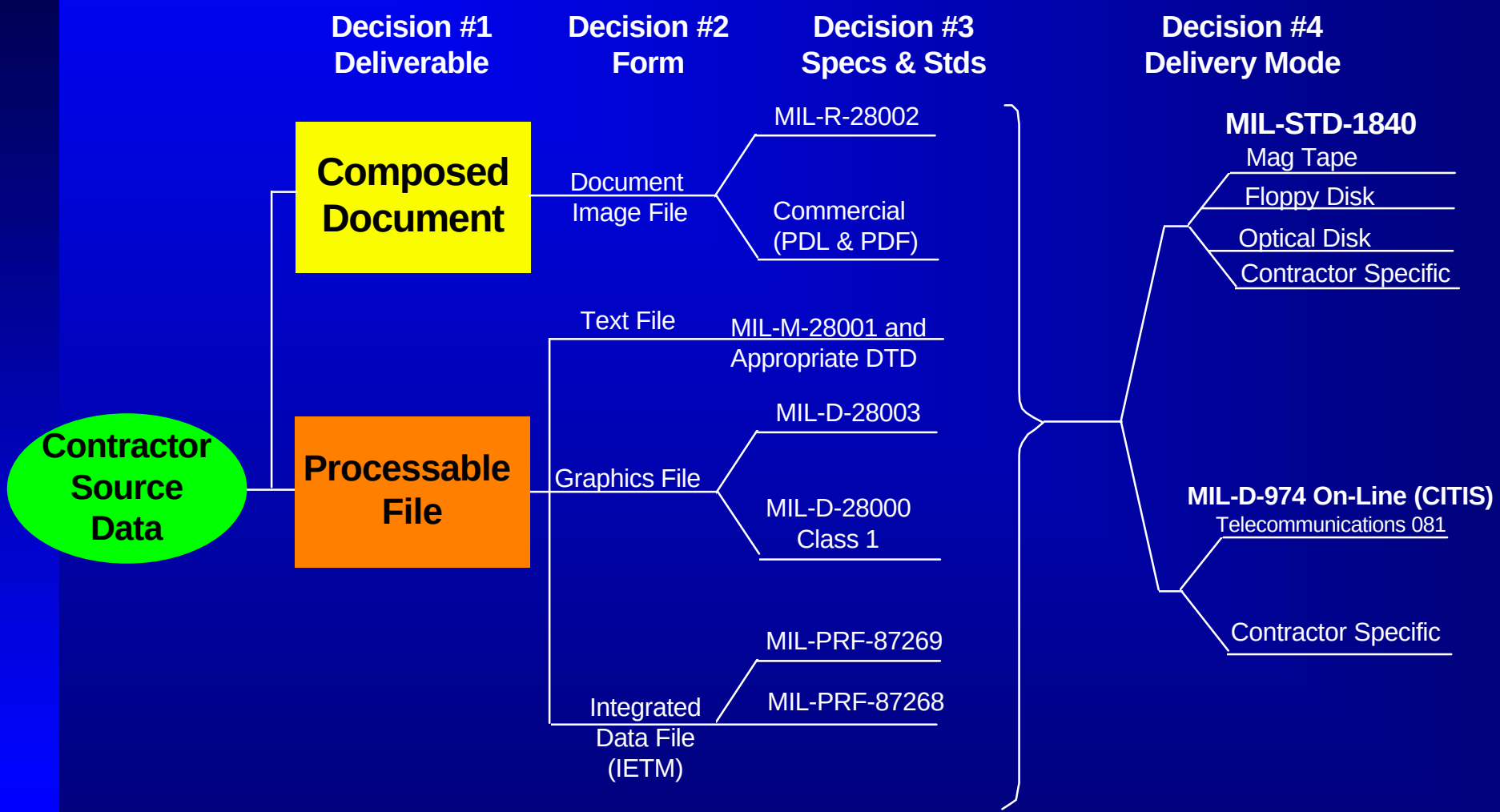
Integrated Data File

- MIL-PRF-87268A (Type C data)
  - Data is tagged according to task function vs MILSPEC format
  - IETMs and IETMs presentation software development
  - Text, tables, graphics, dialogs, and links components
  - Common user interface functions
  - Electronic Display System (EDS)/IETMs interrelationship
- MIL-PRF-87269A
  - Revisable database requirements for

IETM Deliverables

- Entire IETM database
- Numbered and delivered as a single TO
- System that authors and generates an IETM database instance
- System that reads and displays an IETM database instance
- Combinations of the above

MIL-HDBK-59B
Decision Template # 4



Delivery Mode Options

- MIL-STD-1840
  - Less expensive than telecommunications investment
  - Mag tape, floppy and optical disk
  - Contractor specific
- Telecommunications
  - Large amounts of data can make this option cost prohibitive
  - Security issues

Technical Manual Contract Requirements (TMCR)

- TM-86-01 identifies TO Program Requirements and the Specification Interface Requirements
- Referenced in DoD 5010.12-M and TO 00-5-3
- Must be tailored by the contractor IAW TO risk factors in the SOO and attached GCO requirements
- Note that Instructions To Offeror may promote contractor preparation of TMCR (TO 00-5-3 Appendix F.)
- Cross-referenced with CDRL requiring TO delivery
- CDRL and TMCR are an exhibit to RFP

TM-86-01 Part A - TM Type Selection Tables Draft

TM TYPE REQUIREMENTS FOR THE (System/Equipment)

Title or Type of Manuals	Specification	Will be Prepared (Yes/No)	I T
1. Inspection TOs	MIL-PRF-5096		
a. Inspection and Maintenance Requirements (-6) Manual		_____	_
b. Acceptance and Functional Check Flight (FCF) Procedures (-6CF) Manual		_____	_
c. Acceptance and Functional Check Flight (-6CL) Checklist		_____	_
d. Workcards		_____	_
e. Inspection Requirements Cards		_____	_
f. Flow/Sequence Charts		_____	_
g. Checklists			
(1) Maintenance/Operations (Non-Aircrew)		_____	_
(2) Operations (Aircrew)		_____	_
2. Cargo Aircraft Loading and Offloading TOs	MIL-PRF-5288		
a. Manual		_____	_
b. Checklists		_____	_
3. Weight and Balance (Aircraft)	MIL-PRF-5920		
a. Loading Data Manual		_____	_
b. Sample Basic Weight Checklists		_____	_

TM-86-01E Part B - TM Delivery Requirements Matrices Draft

TM DELIVERY REQUIREMENTS MATRIX FOR SYSTEMS/ITEMS _____

DELIVERY SCHEDULE

Event ⇨ Enter number of days data required prior to event ⇨	In-Process Review (_ _ Days)	Verification (_ _ Days)	Prepublication Review (_ _ Days)
Enter Office Symbol and Address ⇩	Enter Copy Quantities Required ⇩	⇩	⇩

TM-86-01E Part C - Standardization Document Tailoring Draft

STANDARDIZATION INTERFACE RECORD FOR **MIL-STD-1840B**
3 November 1992

Automated Interchange of Technical Information

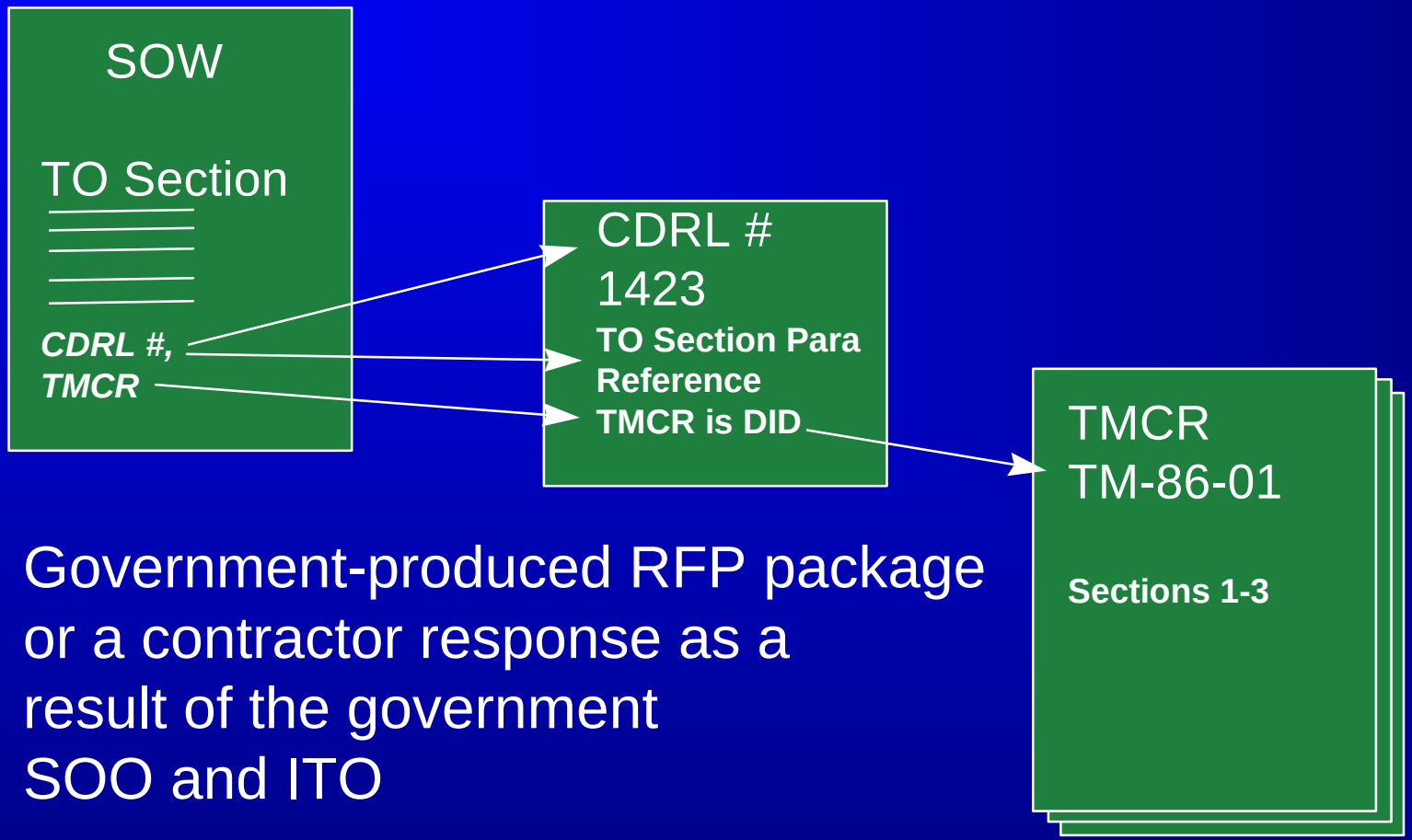
4.2 The transfer unit shall be encoded in an appropriate format for the type of transfer unit specified below.

4.2.2 Page Description Language (PDL) transfer units will only be used to update volatile (changeable) legacy data using a commercial word processing format. Note: The preferred AF method is Adobe Portable Document Format (PDF) file indexed in accordance with the AF Digital Data Strategy.

Statement of Objectives

- To provide digital technical orders that will support the XYZ system throughout its useful life-cycle and that will be formatted to the Joint Computer-aided Acquisition and Logistics Support System (JCALS) TO Management System.
- TO-00-5-3 Par. 3-3.1.1 The SOO should specify TO objectives in performance-based terminology. Evaluation criteria (RFP section M) must support the SOO and ITO sections. The ITO must be explicit enough to allow the

The Contractual Picture



Government-produced RFP package or a contractor response as a result of the government SOO and ITO

Statement of Work

- "The contractor shall develop technical orders to support the XYZ program in accordance with the requirements, schedules, and tables in the Technical Manual Contract Requirements document, TM-86-01/T (Exhibit)." (CDRL #1, CDRL #2)
- Required TO Management Data
  - TO Publication Plan, TO Validation Plan, Explosive Ordnance Disposal Procedures
  - CDRLs must be tailored to require digital delivery

CDRL Annotations

- One CDRL for all program TOs
  - Multiple sub-clins
- Block 4: TMCR-86-01 is the authority (DID)

CDRL Example

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

Paraphrased Paperwork Reduction Act Statement

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY
003	T	TDP ____ TM X OTHER ____

D. SYSTEM/ITEM	E. CONTRACTOR/PR NO.	F. CONTRACTOR
XYZ Subsystem	00000-93-C-0000	

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
T001	TECHNICAL MANUALS	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
TMCR-86-01	PARA 3.7.4.2	

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14. DISTRIBUTION		
DD	C	AS REQ	BLK 16	a. ADDRESSEE	b. COPIES	
8. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION BLK 16		DRAFT	FINAL REG / REPRO
A						

16. REMARKS

Ref Blks 12 and 13: Delivery schedule is outlined in attached TM-86-01.

Ref Blk 14: See attached TM-86-01 for distribution requirements.

G. PREPARED BY	H. DATE	I. APPROVED BY		J. DATE

17. PRICE GROUP	18. ESTIMATE TOTAL PRICE	Page 2 of XX Pages

DD Form 1423-1, JUN 90 Previous editions are obsolete

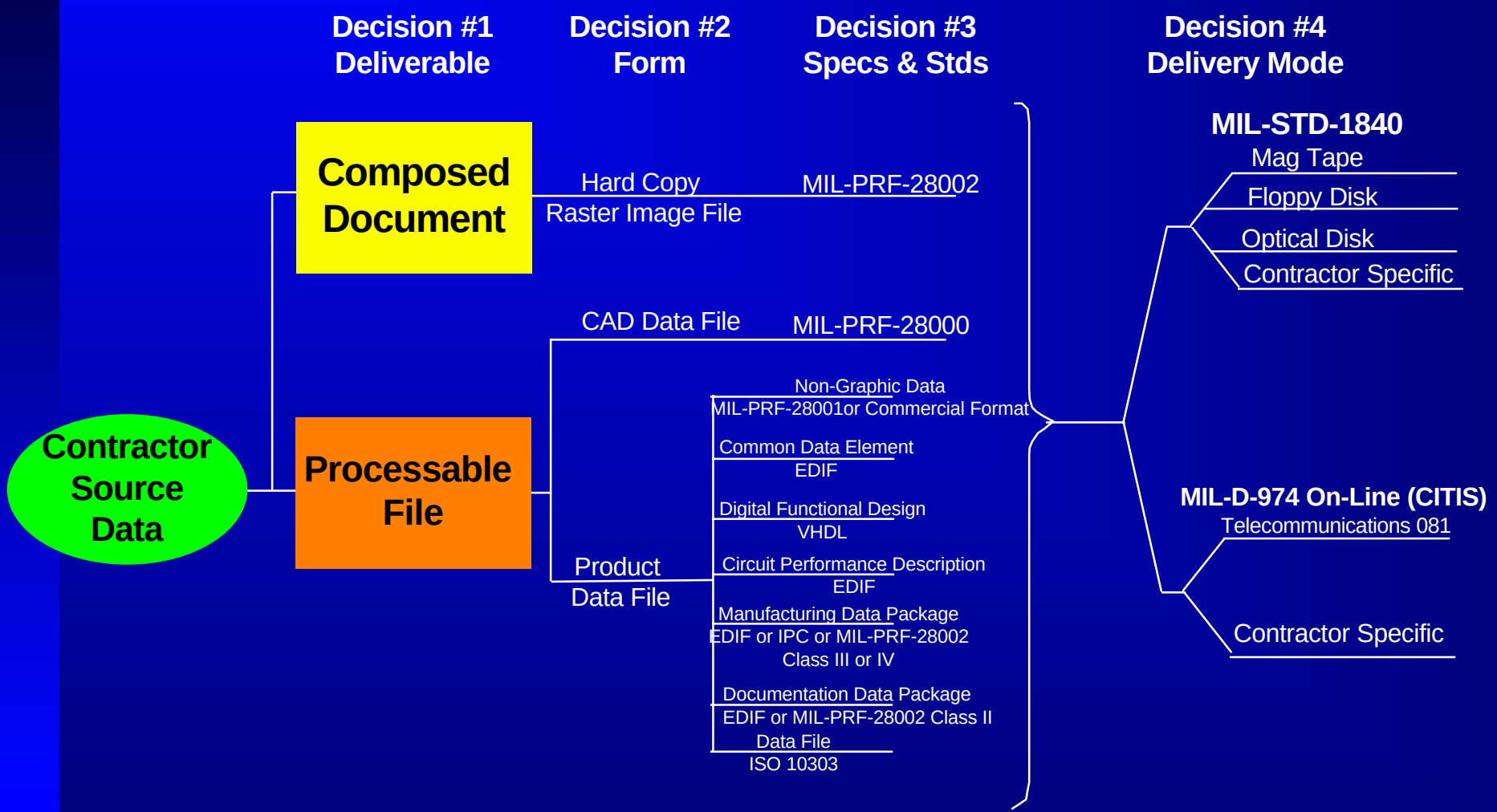
Technical Data Packages (Engineering Data)

- Described in MIL-T-31000 and in ASME Y14.100M
  - MIL-T-31000 retained and is being revised IAW MIL-STD-961, Information on Spec Writing
  - New MIL-T-31000 due out on 30 Sep 1996
- Product's technical description
  - Design, manufacturing, quality assurance, and packaging characteristics
- TDP elements
  - Drawings and associated lists
  - Illustrated text documents

Acquiring TDPs

- Program office and Engineering Data Management Office (EDMO) participation
- Determination of engineering data requirements
- Digitization of commercial manuals
- Discussion of CALS requirements at Engineering Data Guidance Conference and Integrated Product Team Meetings

Graphic: TDP Decision Template



Engineering Drawing Acquisition

- MIL-T-31000
- ASME Y14.100M series: General Specs for TDPs
- MIL-STD-100E (101.11, 16; 704.1.1)
- MIL-HDBK-288, Review and Acceptance of Engineering Drawing Practices
- MIL-STD-1840 Tailor Sections 4 and 5
- Consult users requirements, infrastructure, and intended data

MINUTES OF THE DEFENSE STANDARDS IMPROVEMENT COUNCIL MEETING - 10 JUL 96

ANNOUNCEMENTS

- The Council chair provided an update on the progress or the Specifications and Standards Reform memorandum. Either Dr. Kaminski or Mr.Longuemare will be signing a general exhortative acquisition reform memo which will have as an attachment specific guidance on specification reform.

DOCUMENT UPDATES

- MIL-STD-100 - The Council agreed to retain this document as a Standard Practice. This standard will be revised to provide pointers to every feasible commercial practice and will also contain necessary military unique information. The revised standard will be given to the DepSos for review and approval and only forwarded to the DSIC if a major problem occurs. DoD will also adopt the ASME Y14.100 standard and use it when it makes sense to do so.

Digital Data Acquisition

- Engineering Data
  - Deliveries should be in a CALS format identified in the current version of ML-STD-1840 and in a format compatible with the user's digital engineering data repository

Contract Documents

- Engineering data requirement must be stated in Statement of Objectives
- MIL-T-31000, ASME Y14.100 (and others), and MIL-STD-1840 must be tailored and cited
  - To direct the contractor to develop digital drawings
  - To identify digital data interchange standards and specifications for particular data types
  - To identify data delivery requirement
- Statement of Objectives prepared

SOO Considerations
Until JEDMICS is Functional
Performance Spec-related

- Options:
  - EDCARS: **See your local EDMO & EDCARS Rep**
    - Must order 1/2'', 9-track, MIL-STD-1840A format with modified header data in data file
    - MIL-PRF-28002B (Group 4, type 1 {untiled})
    - Each file "Source document identifier" record must correspond with holerith data for corresponding image file
    - DD Form 2554-1 data element items can be found in Back-up sheet for DD Form 2554-1

Sample Statement of Work Language

XX Engineering Data: The contractor shall develop/produce/maintain a Technical Data Package (TDP) that accurately depicts the final product. A TDP is defined as a technical description of item(s) adequate for supporting an acquisition strategy, production, engineering and logistics support. The drawings provided as part of the TDP shall reflect the level of design maturity that the item has attained. Drawings and associated lists shall provide the necessary design, engineering, manufacturing, and quality assurance requirements information necessary to enable the procurement or manufacture of an interchangeable item that duplicates the physical and performance characteristics of the original product, without additional design engineering effort or recourse to the original design activity. The contractor shall produce and maintain documentation for all electrical assemblies/subassemblies in such a manner to ensure their functional integration without recourse to Special Test Equipment (STE) or installation of the assemblies or subassemblies into a next higher assembly. For the contractor's information only, the contractor may find it useful

Statement of Objectives Language

XX ENGINEERING DRAWING PRACTICES: The contractor shall use the practices described in MIL-STD-130G, MIL-STD-804C, MIL-HDBK-288B, MIL-STD-12, IPC-D-275, ASME Y14.24M, ASME Y14.34M, ANSI Y14.1, ANSI Y14.2M, ANSI Y14.4M, ANSI Y14.6, ANSI Y14.7.1, ANSI Y14.7.2, ASME Y14.8M, ANSI Y14.13M, ANSI Y14.15, ANSI Y14.15a, ANSI Y14.15b-1973, ANSI Y14.17, AMSE Y14.18, ANSI Y14.5M, ANSI Y14.3, ANSI Y14.36, ANSI Y32.10, ASTM E380, ANSI/AWS A2.4, ANSI/AWS A3.0, ANSI/IEEE Std 91, ANSI/IEEE Std 200, ANSI/IEEE Std 260, ANSI/IIEEE Std 280, IEEE Std 315, ANSI/IEEE Std 991, ANSI/IPC-D-350, ANSI/IPC-T-50, and SAE AS1290 first, and then best commercial practices. The contractor may find it useful to use MIL-STD-100E for guidance. [DI-DRPR-81000/T, DI-DRPR-81002/T]

CDRL Addendum

This information could reside in ITO

- Instructions for data file header information to accommodate EDCARS
  - Document declaration
  - Data Files
  - AF PDSM Program Office is developing a standard backup sheet for 1840A compatability to EDCARS
    - **Guidelines developed; reviewed by ALCs; ready for testing**
- ALC provides unique data file record information for specific contracts as an attachment to contract
  - Contact your EDMO

RFP ITO Items & Contractor Proposal elements

- Use DD Form 2554-1 Back-up Sheet guidelines to provide data element instructions to the contractor
  - This information could be annotated in the CDRL in lieu of a formal DD Form 2554-1
- Tailor it to meet your local repository requirements
- For help contact:
  - Your EDMO
  - AF PDSM Program Office

CONTRACT DATA REQUIREMENTS LIST

(Data Item)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY TDP X TM OTHER
D. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

1. DATA ITEM NO	2. TITLE OF DATA ITEM	3. SUBTITLE
	DI-DRPR-81000 PRODUCT DRAWINGS AND ASSOCIATED LISTS	XXX WEAPONS PLATFORM

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
SEE BLK 16		

7. DD 250 REQ	8. APP/ CODE	9. FREQUENCY	10. DATE OF FIRST SUBMISSION	11. AS OF DATE	12. DATE OF SUBSEQUENT SUBMISSION
DD	A				

8. PRP STATEMENT REQUIRED: SEE BLK 16

13. REMARKS

BLK 4: DI-DRPR-81000, DD FORM 2554-1 WITH ATTACHMENT. IF ORDERED, REPRO COPIES SHALL BE IAW MIL-D-5480, (ADD TYPE, CLASS, & KIND)

BLK 9: APPROVAL SHALL BE BASED ON COMPLIANCE WITH REQUIREMENT DOCUMENTS CITED IN BLK 4. THE TIME REQUIRED FOR GOVERNMENT APPROVAL WILL NOT EXCEED _____ DAYS AND TURNAROUND TIME FOR THE CONTRACTOR TO RESUBMIT DATA TO GOVERNMENT SHALL NOT EXCEED _____ DAYS. (ADD TIME REQUIRED FOR GOVERNMENT APPROVAL AND TURNAROUND TIME FOR CONTRACTOR TO RESUBMIT DATA TO GOVERNMENT.)

BLK 9: TECHNICAL DATA SHALL BE MARKED (DISTRIBUTION STATEMENT AND EXPORT CONTROL WARNING NOTICE) IAW MIL-STD-1806, MIL-STD-100, AND CDRL SUPPLEMENT ATTACHMENT. VENDOR ITEM DRAWINGS SHALL BE DISTRIBUTION STATEMENT A, PROVIDED WHERE USED ON BLOCK 8 IS BLANK; OTHERWISE, ALL REMAINING DRAWINGS SHALL BE DISTRIBUTION STATEMENT ____ (SPECIFY LETTER)
SEE CDRL SUPPLEMENT ATTACHMENT.

BLK 14: DISTRIBUTION SHALL BE IAW CDRL SUPPLEMENT ATTACHMENT.

THIS IS A SAMPLE CDRL. INFORMATION SHOULD BE TAILORED TO REFLECT PROGRAM REQUIREMENTS

NOTES: (1) COMPLETE THIS FORM IAW "INSTRUCTIONS FOR COMPLETING DD FORM 1423" AND DOD 5010.12-M (CHAPTER 3). INCLUDE REFERENCE TO DD FORM 2554-1, CDRL SUPPLEMENT ATTACHMENT(S), AND ATTACHMENT(S) AS NEEDED. (2) COMPLETE DD FORM 2554-1 IAW MIL-T-81000 (ENTER DIGITAL DATA SPECIFICATION, EXCHANGE MEDIA, ETC., IN BLOCK 1.C OR VIA CONTRACT ATTACHMENT (3) COMPLETE ATTACHMENT(S) FOR DD FORM 2554-1 AND CDRL SUPPLEMENT.

14. DISTRIBUTION

a. ADDRESSES	b. COPIES Draft	Final Reg	Final Repro
SEE BLK 16			
15. TOTAL			

16. PREPARED BY	17. DATE	18. APPROVED BY	19. DATE

FIGURE 10. Sample CDRL For TDP Elements

TDP OPTION SELECTION WORKSHEET

PRODUCT DRAWINGS AND ASSOCIATED LISTS

A. CONTRACT NO.	B. EXHIBIT/ATTACHMET NO.	C. CLIN	D. CDRL DATA ITEM NO.

1. DELIVERABLE PRODUCT (X and complete as applicable)

a. ORIGINALS (Drawing masters) (Identify specification, type, grade and class, etc.)

b. REPRODUCTIONS (Identify specification, type, grade and class, etc., and quantity of each)

X c. DIGITAL DATA (Identify specification, exchange media, etc.)
See contract attachment for DD Form 2554-1 Digital Data Deliverables

2. CAGE CODE AND DOCUMENT NUMBERS (X one)

a. CONTRACTOR

b. GOVERNMENT (Complete (1) and (2) or (3))

(1) Use CAGE Code (2) Use Document Numbers (3) To Be Assigned By

3. DRAWING FORMATS AND DRAWING FORMS (X one and complete as applicable)

a. CONTRACTOR FORMATS. Forms to be supplied by contractor.

b. GOVERNMENT FORMATS. Forms to be supplied by contractor.
Samples supplied by (Specify)

c. GOVERNMENT FORMATS. Forms to be supplied as
Government Furnished Material by (Specify)

4. TYPES AND QUANTITY OF DRAWINGS SELECTION (X one)

a. CONTRACTOR SELECTS	b. GOVERNMENT SELECTS (Specify in Item 9)

5. ASSOCIATED LISTS (X and complete as applicable)

a. PARTS LISTS (X one)	(1) Integral		(2) Separate	(3) Contractors Option
b. DATA LISTS (X one)	(1) Not Required		(2) Required (Specify levels of assembly)	
c. INDEX LISTS (X one)	(1) Not Required		(2) Required (specify levels of assembly)	

6. DETAILS (X one)

a. MULTIDETAIL DRAWINGS PERMITTED	b. MONODETAIL DRAWINGS MANDATORY

7. QUALITY ASSURANCE PROVISIONS (X one)

a. NOT REQUIRED. MIL-T-31000, para 3.6 does not apply.

b. REQUIRED. MIL-T-31000, para 3.6 applies. Quality assurance requirements shall be documented as QAPs in accordance with MIL-T-31000, Appendix B. (X one)

	(1) DARCOM Form 2484-R Required	(2) DARCOM Form 2484-R Not Required

8. VENDOR SUBSTANTIATION DATA (X one)

a. NOT REQUIRED	b. REQUIRED

9. OTHER TAILORING (Attach additional sheets as necessary)

This is a sample DD Form 2554-1 digital data denoted. Information should be tailored to reflect program requirements.

DD Form 2554-1, DEC 89 0102-LF-008-3200 U.S. GOVERNMENT PRINTING OFFICE 1990 - 754-040

FIGURE 11. Sample DD form 2554-1 Digital Data Denoted

Contract #_____
Page 1 of _____

ATTACHMENT XX

DD FORM 2554-1, BLK 1.c, DIGITAL DATA DELIVERABLES

2554-1. BLK 1.c	Order (...)	PRODUCT DELIVERABLES IN DIGITAL FORMAT
(1)	( )	DRAWING MASTER RASTER DATA
(2)	( )	DRAWING TRIAL RASTER DATA
(3)	( )	DRAWING MASTER PRODUCT DATA
(4)	( )	DRAWING TRIAL PRODUCT DATA
(5)	( )	DRAWING MASTER NATIVE CAD/CAE DATA
(6)	( )	DRAWING TRIAL NATIVE CAD/CAE DATA
(7)	( )	DRAWING MASTER IGES CAD/CAE DATA
(8)	( )	DRAWING TRIAL IGES CAD/CAE DATA
(9)	( )	OTHER - SEE NOTE BELOW
(10)	( )	TBD
(11)	( )	TBD
(12)	( )	TBD

REQUIREMENTS FOR CALS PRODUCT DELIVERABLES

(1) Drawing Master Raster Data. Drawing master raster graphic tape shall be IAW MIL-R_28002, MIL-STD-1840 and the following requirements. Data shall be on a 9-track magnetic tape. Raster graphics shall be type 1 unitied raster data, 512 X 512 in size. Each delivered 9-track tape shall include a ANSI label. Raster image density shall be 200 PELS/inch. The minimum number of PELS per line and minimum number of scanlines shall be IAW MIL-R-28002. Raster image orientation shall be PEL path of 90 line progression of 270. Acceptance of this data item shall be based upon: self merit/content; prior acceptance and validation of drawing trial raster data, BLK 1.c(2), if ordered; and visual comparative agreement with drawing originals or reproductions, if ordered.

(2) Drawing Trial Raster Data. Requirements shall be the same as those for drawing master raster data, BLKI 1.c(1), SANS prior acceptance of self.

(3) Drawing Master Product Data. Drawing master product data shall be IAW VHDL ANSI/IEEE 1076, EDIF EIA 548, and IPC-D-350 and the following requirements. Data shall be on MIL-STD-1840 magnetic tape format optical disk, CD-ROM, or magnetic disk with a mutually agreed upon format. Data shall be organized as one drawing per file with multiple sheets permitted. Entities unsupported or unspecified by the appropriate standards or specifications (VDHL, IPD, etc.) shall not affect the data transfer integrity of the product information delivered under the contract. Format version "(X)" shall be used. Acceptance of this data item shall be based upon: self merit/content; prior acceptance and validation of drawing trial product data. BLK 1.c(4), if ordered; and visual comparative agreement with drawing originals or reproductions, if ordered. Validation here means determination of acceptable transfer and translation of data from the contractor's CAD/CAE system to the _____(add applicable interfacing system).

NOTE: THIS IS A SAMPLE ATTACHMENT. INFORMATION SHOULD BE TAILORED TO REFLECT PROGRAM REQUIREMENTS. SEE TECHNICAL MANUALS SECTION OF THE DESKTOP GUIDE FOR "COMPOUND DOCUMENTS" (SPECIFICATIONS, SOFTWARE, DOCUMENTATION, LISTS, ETC.).

FIGURE 12. Sample Contract Attachment On "DD Form 2554-1, BLK 1.c, Digital Data Deliverables"

ATTACHMENT XX (CONT.)

REQUIREMENTS FOR CALS PRODUCT DELIVERABLES (CONT.)

(4) Drawing Trial Product Data. Requirements shall be same as those for drawing master product data, BLK 1.c(3), SANS prior acceptance of self.

(5) Drawing Master Native CAD/CAE Data. Drawing master native CAD/CAE data shall be as follows. The data file format shall be compatible with and delivered on a 9-track QIC tape, CD-ROM or magnetic disk, compatible with _____ (insert vendor product name). CAD/CAE system media shall be clearly labeled to describe the media format method, content, and media density. Data shall be organized as one drawing per file with multiple sheets permitted. Data format shall be compatible with _____(insert vendor application package name, version number) format, using the native binary format supported by the _____ (insert vendor product name) CAD system. All information necessary to open and manipulate the data files, including: libraries, logical name definitions, and other supporting files shall be delivered with drawing files. Non-vendor-supported "Utilities" (i.e., software product) shall not affect the data transfer integrity of the product information delivered under the contract. Acceptance of this data item shall be based upon: self mem/content; prior acceptance and validation of drawing trial native CAD/CAE data, BLK 1.c(6), if ordered; and visual comparative agreement with drawing originals or reproductions, if ordered. Validation here means determination of acceptable transfer and translation of data from the contractor's CAD/CAE system to the ___. (add applicable interfacing system).

(6) Drawing Trial Native CAD/CAE Data. Requirements shall be the same as those for drawing master native CAD/CAE data, BLK 1.c(5), SANS prior acceptance of self.

(7) Drawing Master IGES CAD/CAE Data. Drawing master IGES CAD/CAE data shall be as follows. Data shall be delivered on a 9-track tape, QIC tape, or magnetic disk. Data shall be organized as one drawing per file with multiple sheets permitted. MIL-D-28000 defined entities are mandatory. Entities not fully supported or supported by a subset of MIL-D-28000 to best match the contractor's CAD features, shall be identified by the contractor. Unsupported or unspecified "volunteer" entities shall not affect the data transfer integrity of the product information delivered under the contract. Data product files shall be written in ASCII form. Acceptance of this data item shall be based upon: self mem/content; prior acceptance and validation of drawing trial IGES CAD/CAE data, BLK 1.c(8), if ordered; and visual comparative agreement with drawing originals or reproductions, if ordered. Validation here means determination of acceptable transfer and translation of data from the contractor's CAD/CAE system to the _____(add applicable interfacing system).

(8) Drawing Trial IGES CAD/CAE Data. Requirements shall be same as those for drawing master IGES CAD/CAE data, BLK 1.c(7), SANS prior acceptance of self.

(9) TBD

(10) TBD

(11) TBD

(12) TBD

THIS IS A SAMPLE ATTACHMENT. INFORMATION SHOULD BE TAILORED TO REFLECT PROGRAM REQUIREMENTS.

FIGURE 12 (cont.). Sample Contract Attachment On "DD Form 2554-1, BLK 1.c,

ATTACHMENT XX

DD FORM 1423-1, BLK 14, "DISTRIBUTION"

CONTRACT #
PAGE 1 OF X

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY TDP ______ TM ______ OTHER ______
D. SYSTEM/ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES														
	Draft	Final		DIGITAL (DD FORM 2554-1, BLK 1.C)											
		Reg	Repro	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	( )	( )	( )
15. TOTAL →														

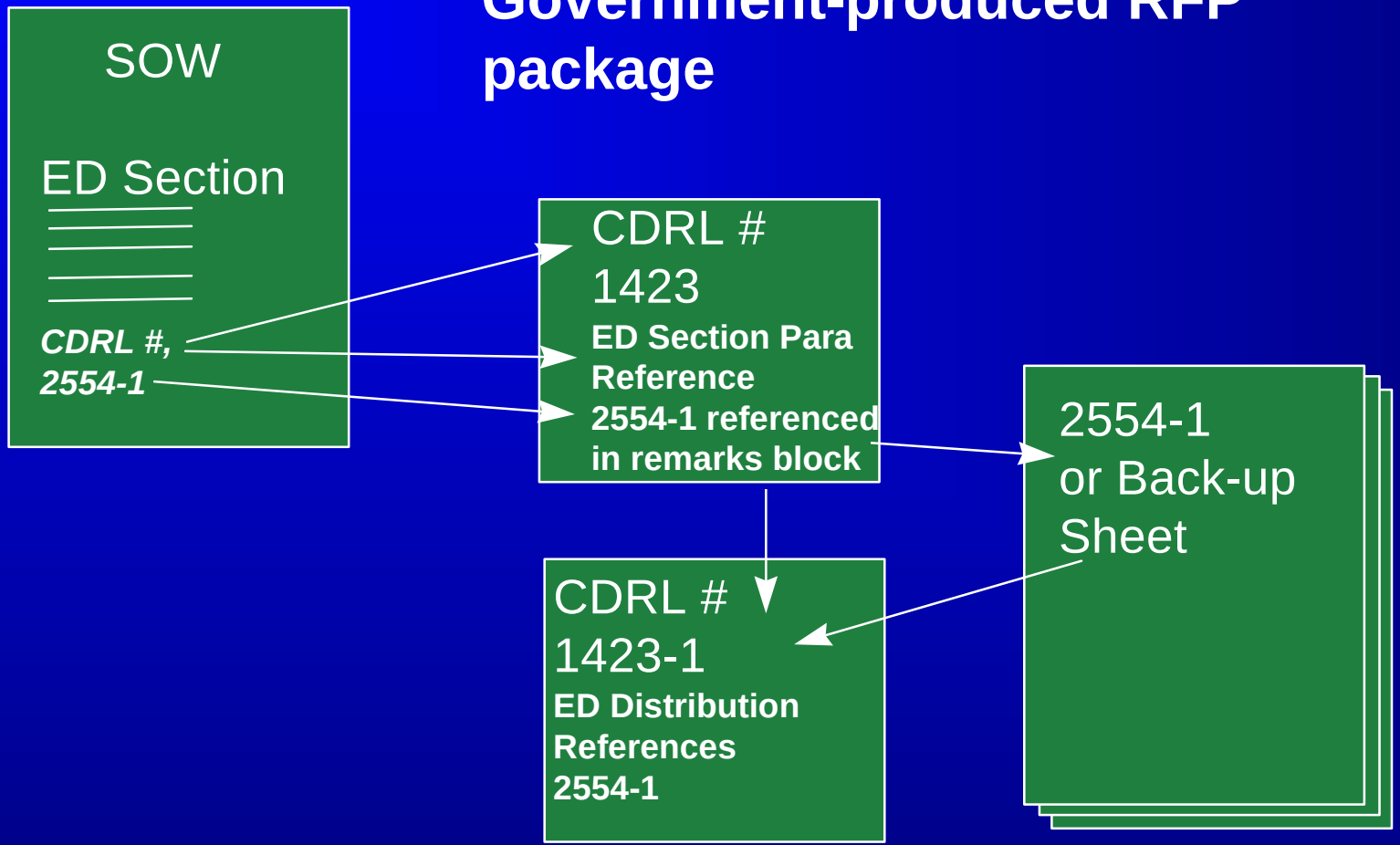
THIS IS A SAMPLE CDRL SUPPLEMENT ATTACHMENT.
TAILOR INFORMATION CONTENT TO REFLECT PROGRAM REQUIREMENTS

DIGITAL LEGEND:
V = VIEW ONLY E = EXTRACT/PROCESS/TRANSFORM U = UPDATE/MAINTAIN C = COMMENT/ANNOTATE A = APPROVE
E.G.: V-4 = VIEW ONLY, FOUR TIMES

FIGURE 14. Sample Attachment for DD Form 1423-1, Blk 14, "Distribution"

The Contractual Picture

Government-produced RFP package



Contractor Integrated Technical Information Service (CITIS)

- On-line, remote access to Data
- Accession list/CDRL should be used to access data
- GCO is most important resource
- Requires tailoring of ML-STD-974
  - Core CITIS functions (Paragraph 4)
  - Optional functions (Paragraph 5)
- SOO must identify any additional CITIS requirements
- Require CITIS description in the RFP ITO

CITIS SOO Language

- Core functional requirements of information integration, storage, exchange, and/or on-line sharing of data
- Government CITIS sites
- Availability of CITIS services during the working day
- Response/Access to CDRL requirements
- CITIS period of performance
- Contractor's requirement to provide leased lines for handling

CITIS Statement of Work Language

"The contractor shall develop a CITIS program IAW MIL-STD-974. The XYZ CITIS program shall be composed of procedures, processes, specifications and software applications for the integration, storage, exchange, and/or on-line sharing of data with the government. The contractor shall ensure that core CITIS functions IAW MIL-STD-974 para 4.7 are implemented.

The contractor shall integrate all information management by establishing a link among logistics, design, manufacturing, and support databases and processes. The contractor will also

Guidance Conference Digital Data Issues

- Sets the pace for CALS implementation
- Establishes a meeting of the minds between contractor and government
- Coordinate digital data discussions with TO and engineering data guidance conferences

RFP Section E

Inspection and Acceptance

- Digital data acceptance
- CITIS acceptance

Digital Data Acceptance

- Physical media acceptance
- Data exchange format acceptance
  - Requires automated tools
    - SGML, CGM, Vector verification
    - SGML-S Parser (Public Domain tool) available
- MIL-STD-1840 format acceptance
  - Requires automated tools
    - IGES format verification

Digital Data Acceptance

- Air Force CALS Test Support
  - CALS standard interoperability testing
  - IGES and Interchange specification support
    - 1840 Tape Tool
    - validg4 for Raster Group 4 files
    - xrasterb browser (viewer)
    - Other COTS testing packages
  - Interoperability testing provides indication for EDCARS compliance
- Formal content and format acceptance

CITIS Acceptance

- Build a CITIS checklist based on Statement of Objectives specs
- Verify service availability, maintenance response regarding core and additional functions
- Verify capability against Statement of Objectives, MIL-STD-974, and checklist

CITIS Acceptance

- Conducting CITIS Test
  - Authorized user accesses test data from customer site
  - Ensure that core and additional CITIS functions operate properly
  - Rerun testing if any major maintenance occurs
- Success Defined

  When contractually required, product or test data is successfully downloaded to the customer's system

RFP Section H

Special Contract Requirements

- Consider a technology refreshment clause here
- Use incentive mechanisms for technology refreshment (i.e., VECPs)

RFP Section J Attachments

- CDRL Package
- TMCR
- GCO as Government Furnished Information
- DD Form 2554-1

RFP Section L Instructions to Offerors (ITO)

- Instruct potential bidders to prepare a Contractor's Approach to CALS (CAC)
- Offers potential bidders an opportunity to propose alternative digital data access/delivery strategies
- Eventually, plans will be provided in proposal
- TO-00-5-3 Par 3-3.1.1 The ITO must be explicit enough to allow the contractor to tailor a TMCR for submittal with the proposal. Evaluation criteria (RFP section

Instructions to Offerors (ITO) Draft TM-86-01E

Instructions, Conditions, and Notices to Offerors or Quoters

Air Force Technical Manual Contract Requirements

PART A: MANAGEMENT AND ADMINISTRATION

1. The offeror shall propose a solution to satisfy Air Force supportability objectives (SOO) with technical manuals for the system. The offeror shall describe the selection and application of required specifications (either commercial or military performance (MIL-PRF)), including associated Document Type Definitions (DTDs) and Formatted Output Specification Instances (FOSIs). In the event the offeror shall propose a non-standard DTDs/FOSIs, the offeror shall describe how this process will be accomplished, including approval to use non-standard DTDs/FOSIs., prior to development. For electronic TO development and delivery, the offeror shall identify the data format and interface requirements, and describe any interrelationship between the TO data and the weapon system/equipment database. The

Alternative Proposals

- Instruct contractor to review the GCO
- Encourage contractor to propose alternative approaches to meeting the digital data delivery requirements
- Can provide cost saving options to government

RFP Section M

Evaluation Factors

- Drives delivery of items in Section L (ITO)
- Describes how proposals will be evaluated
- Should be composed by acquisition team
- TO-00-5-3 Appendix E, E-4: Evaluation criteria (RFP section M) must support the SOO and ITO sections.

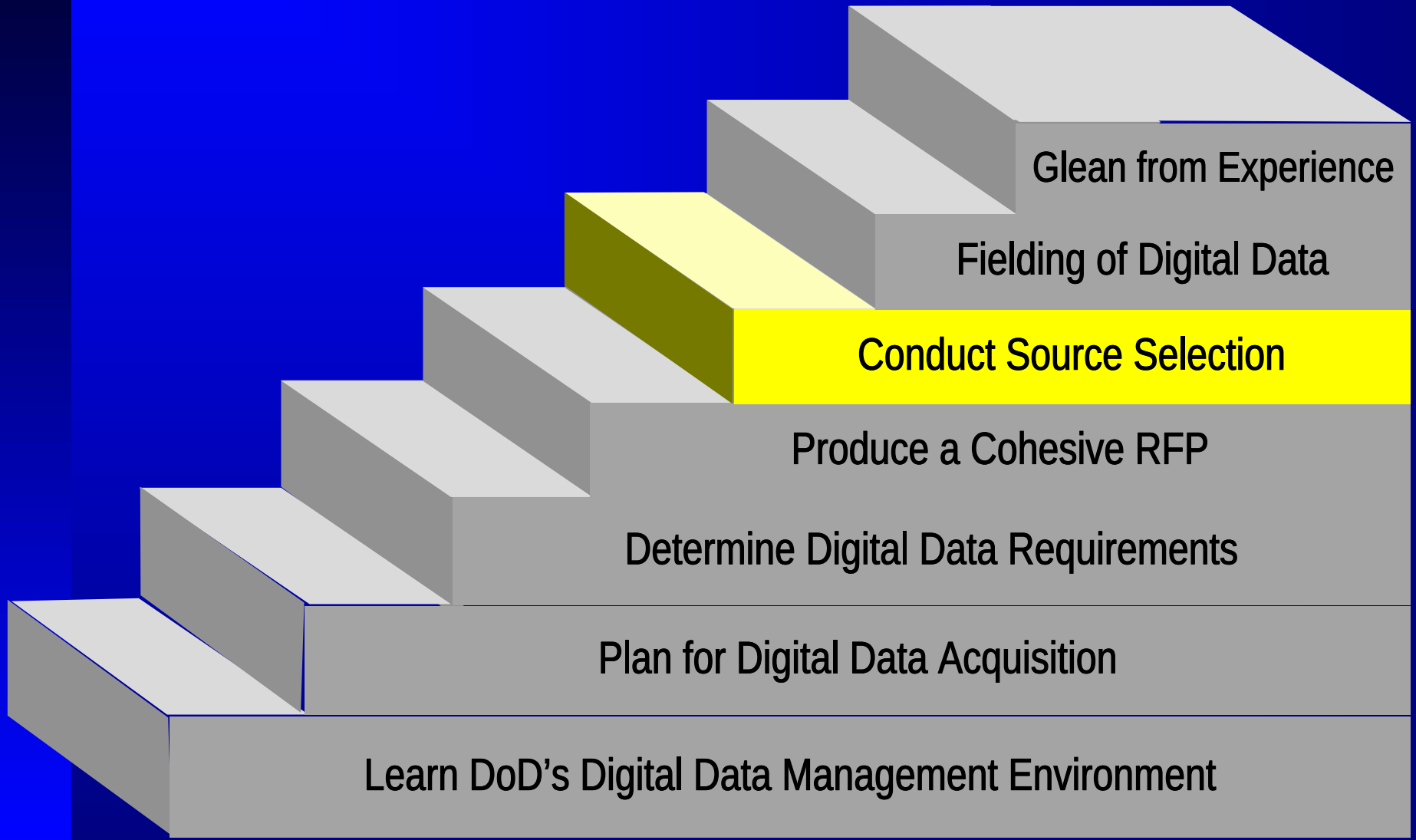
General Evaluation Criteria

- Impact of contractor's approach on life-cycle costs
- CAC thoroughness and innovation
- Grasp of contractor/government digital data processes
- Functional process improvements to be implemented by CALS
- Contractor's intent to comply with RFP and delivery of functional data appropriately

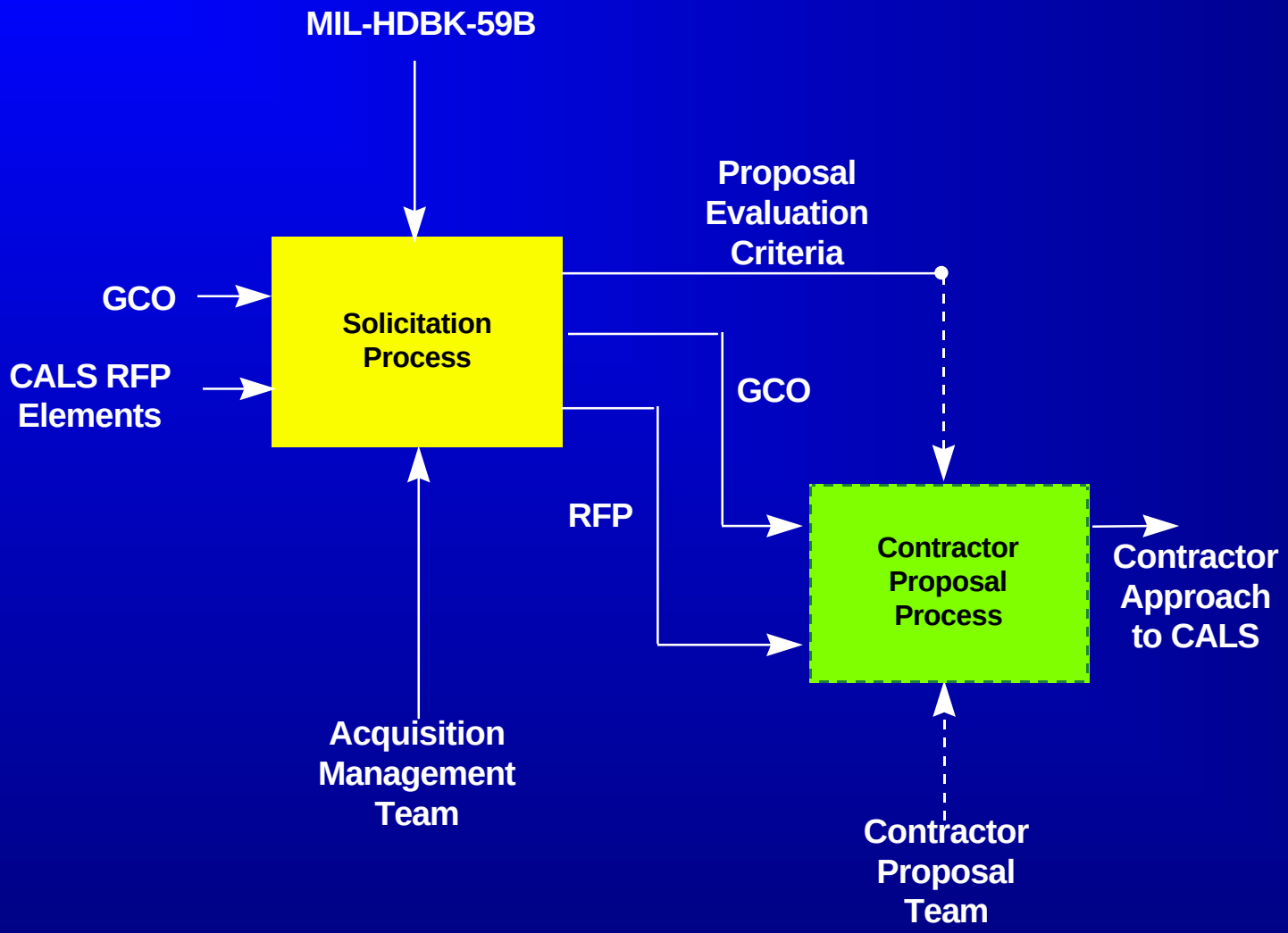
CITIS Evaluation Criteria

- Data integrity (coordinate with RFP Section E)
- System administrative and security capabilities
- Interchange requirements (i.e., speed, capacity)
- System configuration controls and procedures
- Proposed transmission methodology
- Database management and retrieval capability within DoD's

Digital Data Acquisition Steps



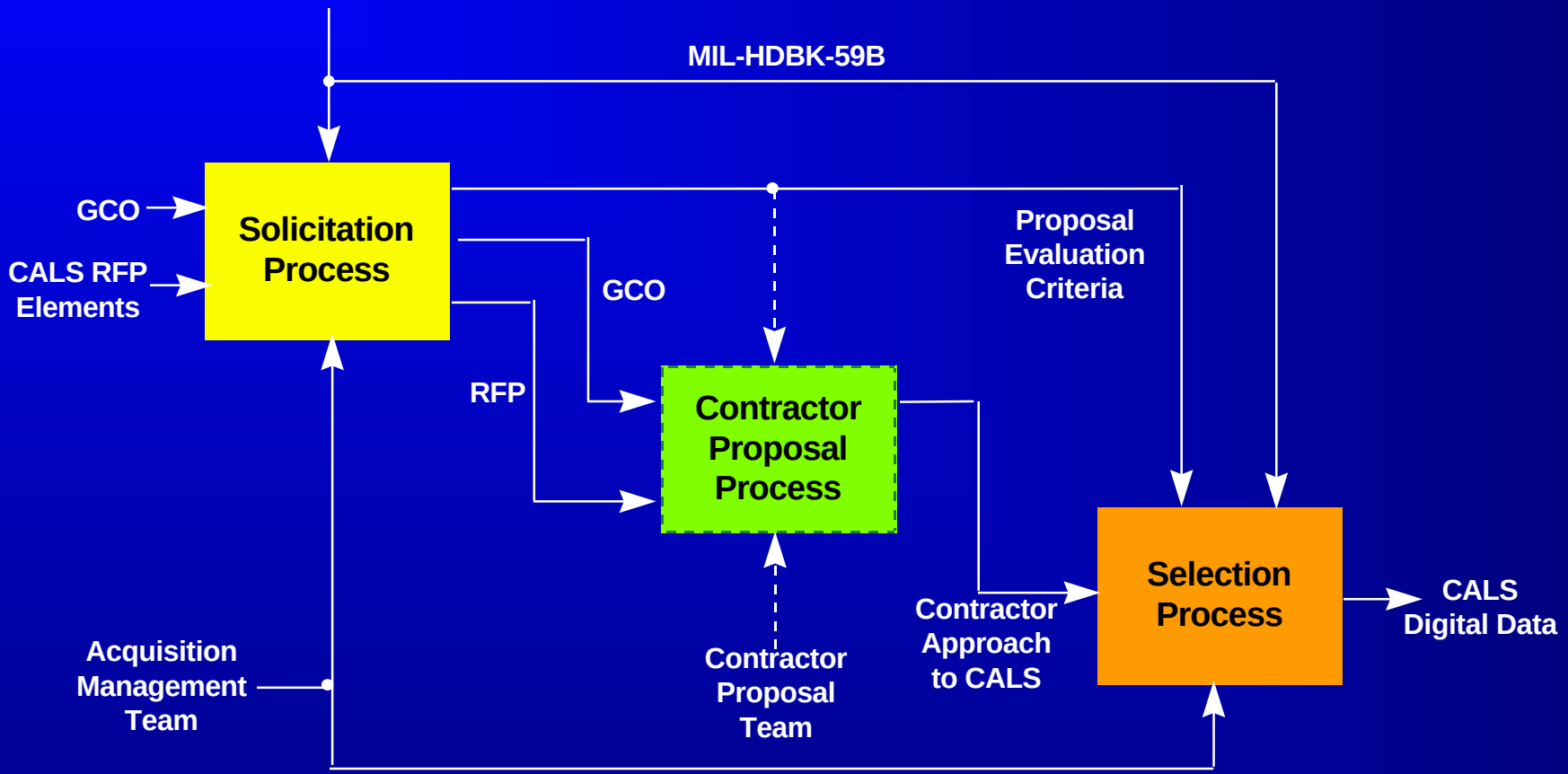
Contractor Proposal Process



Contractor Proposal Process

- Reviews and analyzes RFP and GCO
- Governed by RFP evaluation criteria
- Assembles contractor digital product data management team
- Produces Proposal including CAC

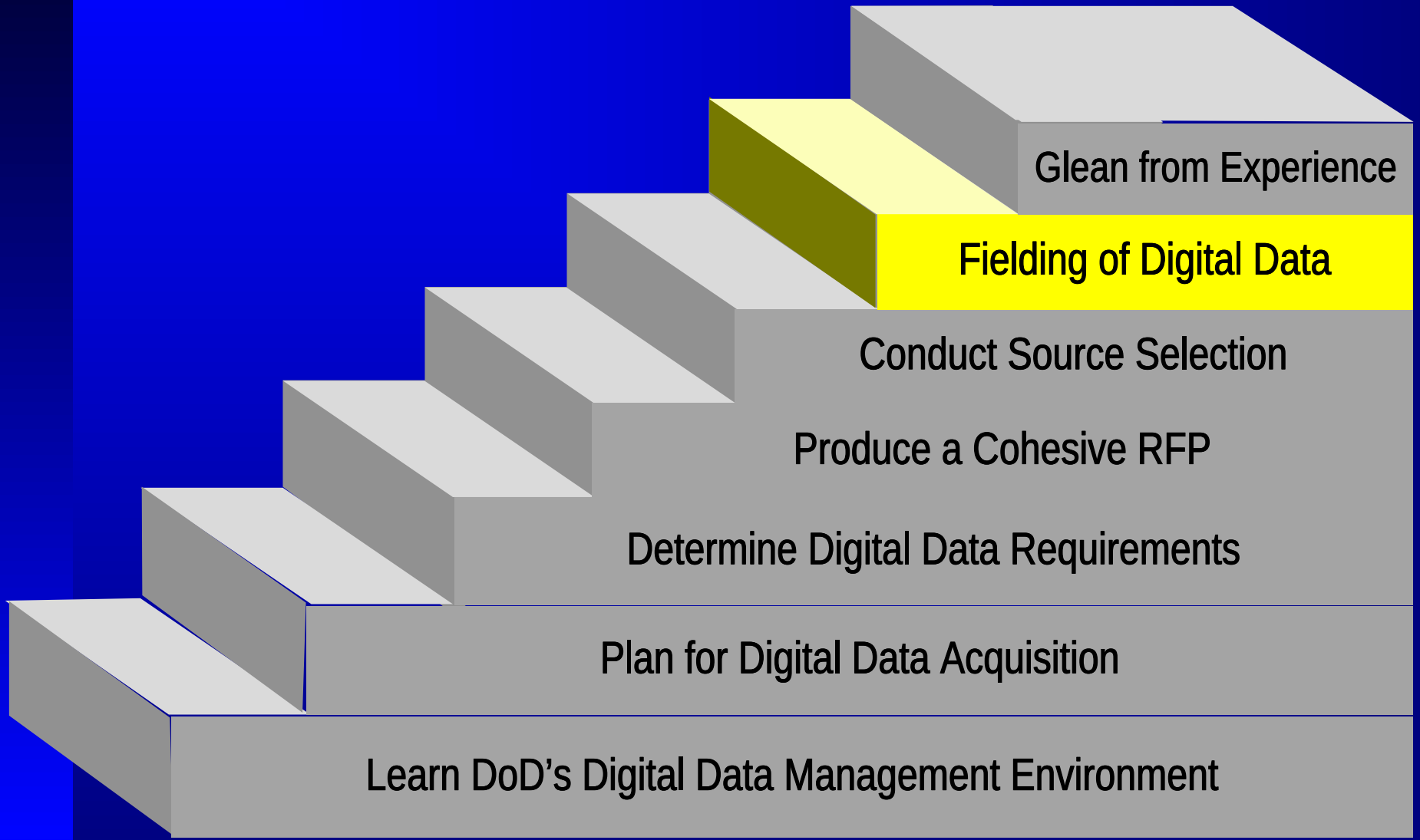
Source Selection Process



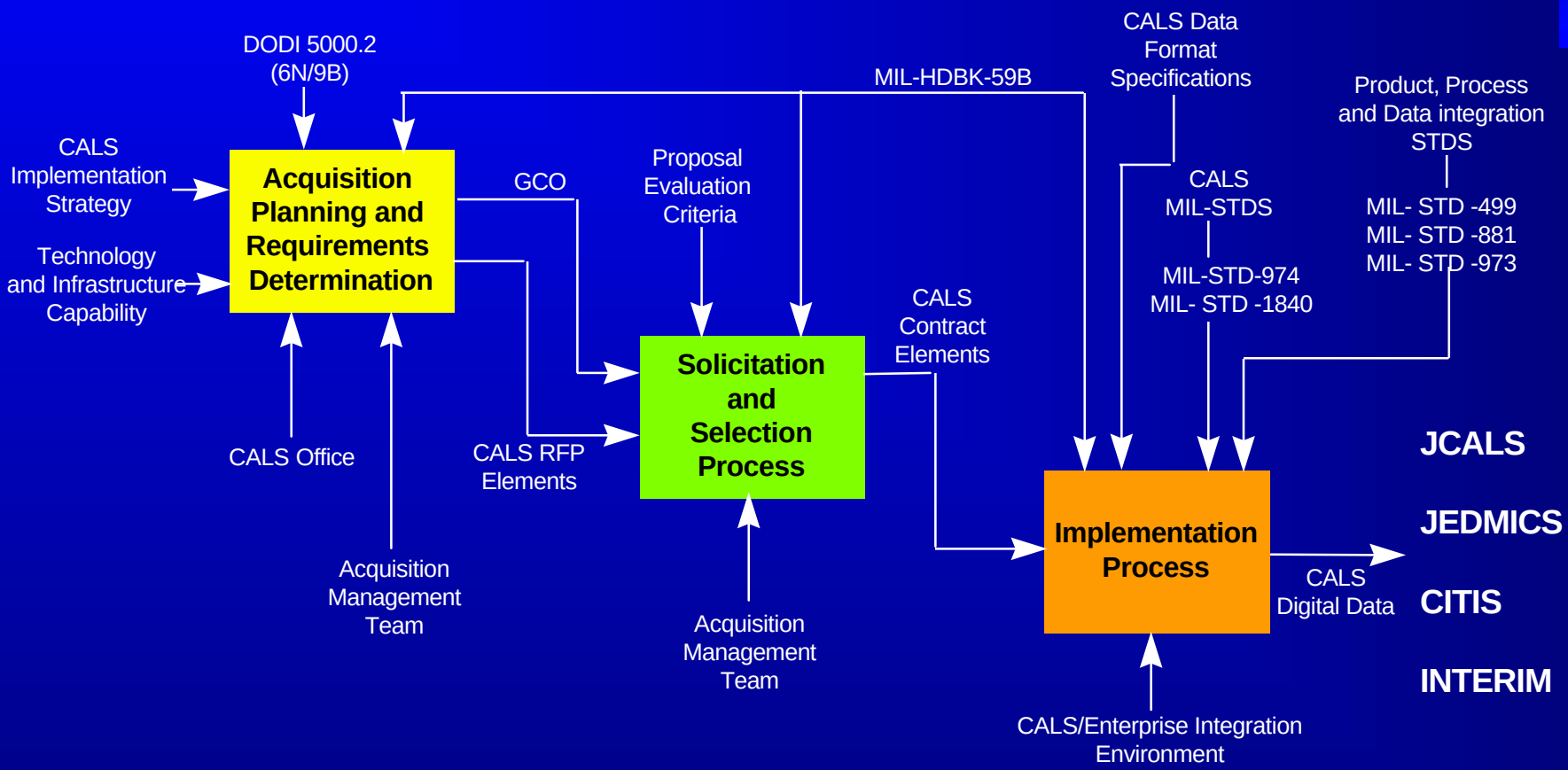
Source Selection Process

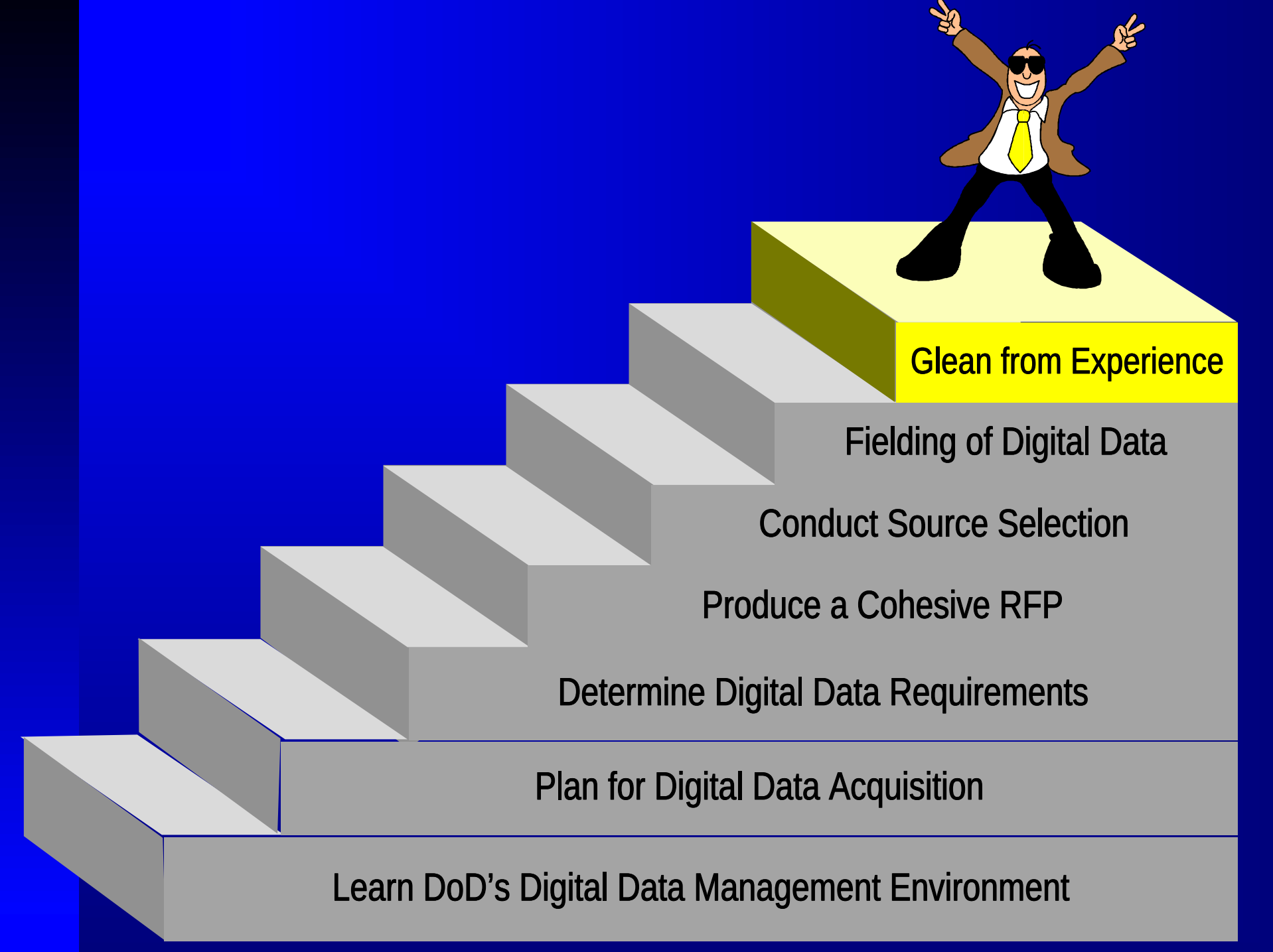
- Assemble digital product data acquisition representatives
- Review and judge proposals including CAC IAW RFP evaluation criteria
- Keep in mind the product data user before making a final decision
- Award the best CAC with the highest points

Digital Data Acquisition Steps



End-to-End Digital Acquisition

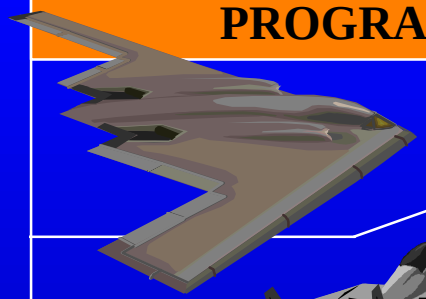
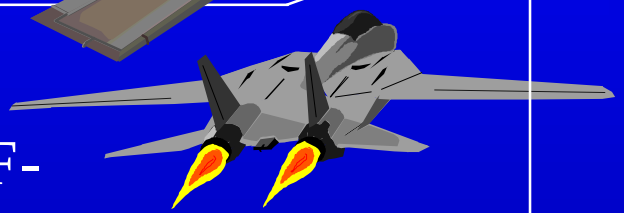



Glean from Experience
Fielding of Digital Data
Conduct Source Selection
Produce a Cohesive RFP
Determine Digital Data Requirements
Plan for Digital Data Acquisition
Learn DoD's Digital Data Management Environment

Glean From Experience

- Past Returns On Investment (ROI)
- Digital Data Acquisition Pointers

ROI Chart

PROGRAM	CAPABILITY	RESULTS & BENEFITS
 B-2	CITIS	*Estimated Cost Avoidance =$10
 F-14 Demonstration	IETM	*100% Correct Fault Isolation (vs 42% with paper TI) *35% Fewer Remove/Replace/Check out Procedure Errors *90% of Technicians Preferred IETMS to Paper
 Comanche (Pre-Milestone II)	Weapon Sys Design CITIS Internal Operations CDRL Data	*Estimated Cost Avoidance =$11. *Estimated Cost Avoidance =$16. *Estimated Cost Avoidance =$17. *Estimated Cost Avoidance =$4.9
AN/SPA-25D Demo (Shipboard Radar) 	IETM	*100% Correct Fault Isolation (vs 58% with paper TI) *24% Faster Troubleshooting th *92% of Technicians Preferred to Paper

ROI Chart

- Reduced engineering cycle time 20-30% on Marine's H-46D and E model helicopter concurrent engineering process
- Reducing engineering data storage costs by $1.7M per year over non-digital storage
- CITIS reduced Titan M ssile's TDY costs to review data by $350K first year
- Reduction of JPATS SPO source selection personnel on a three-to-one ratio

ROI Chart

- JCALS/JEDMICS implementation will save
  - $3.5M/yr = ATOS elimination
  - $1.5M/yr = G022 elimination
  - $5.0M/yr = EDCARS elimination
- Reduction of paper-based TO:
  - Storage costs = $5.9M/yr
  - Printing costs = $2.0M/yr
  - Mailing costs = $1.6M/yr

Acquisition Pointers

- Consult with AF PDSM Program Office early in RFP development
- Discuss digital data issues during guidance conferences
- Request alternative digital data acquisition approaches in the RFP ITO
- Ensure government infrastructure can support delivery and use of data

Acquisition Pointers

- Network to obtain CALS lessons learned
- Require the use of certified vendor products (i.e., SGML-S Parser)
- Work to implement CALS before Milestone II for greatest ROI
- Ensure coordination with SPO and participating agencies
- Test digital data as early as possible

Summary of Steps

- ***Step 1:*** Learn DoD's environment
- ***Step 2:*** Plan for acquisition
- ***Step 3:*** Determine requirements
- ***Step 4:*** Produce a cohesive RFP
- ***Step 5:*** Conduct a source selection
- ***Step 6:*** Understand the fielding of digital data
- ***Step 7:*** Glean from experience

AF PDSM WWW Page
http://www.pdsm.wpafb.af.mil

- AF PDSM Office
- ATOS & JCALS
- EDCARS & JEDMICS
- Tech Order Conversion
- Digital Data Mgt
- AF TO Practices & Procedures
- IPDE/CALS Tutorial
- TMSS
- Training
- Technical Advice
- IPDE/CALS Links
- Fielding & Sustaining Digital TOs

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